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(Original Official Organ U. S. Vet. Med. Assn.)

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CONTENTS

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H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

Vol. LXV, N. S. Vol. 18 July, 1924 No. 4

ANOTHER COLLEGE CLOSES

The Indiana Veterinary College has closed its doors, after an honorable existence of more than thirty years. This institution was the only private veterinary college recognized by the American Veterinary Medical Association for the past five years. With the closing of the Indianapolis school, there remain on the recognized list only eleven veterinary colleges in this country, all state institutions. Whether these will satisfactorily discharge the responsibilities which have fallen upon their shoulders time only will tell. The desire is there. That goes without saying. But whether the eleven states in which these colleges are located will see fit to appropriate the funds necessary for the proper maintenance and growth of these very important parts of our educational system remains to be seen.

It would appear highly desirable for some plan to be worked out whereby the present financial load, incident to veterinary educational institutions, be more evenly distributed over the country. It was recently pointed out in these pages that over one-half of the students in the veterinary colleges in the United States came from seven states, each having one veterinary college. These states (New York, Iowa, Ohio, Colorado, Kansas, Pennsylvania and Michigan) are now educating veterinarians

for the other states not having veterinary colleges. Such great live stock states as Illinois, Indiana, Wisconsin, Minnesota and Nebraska have never appropriated a single dollar for veterinary education, but have depended upon the neighboring states for their supply.

The private veterinary college has been squeezed between the upper and nether millstones of rising costs and diminishing returns. Their plight, however, is in one sense no different from that of the state institution facing the same economic situation. This was brought out recently, in the case of one state veterinary

Central Building, Iowa State College.

college, where an investigation disclosed that it cost $1465.28 per capita to teach a veterinary student while the latter paid only $83.93, or 5.7%, in tuition fees. How long could a private veterinary college be expected to exist, depending almost entirely upon student fees as a source of income? Even those who dole out state funds are beginning to tighten up the purse-strings, when they realize what veterinary education costs, compared with the instruction given students in other professional schools.

The solution lies in the proper recognition, by the state, of the value of the services rendered by veterinarians to the live

stock industry, upon which such a large part of our well-being rests, and the generous appropriation of funds to insure a steady and sufficient supply of well educated and practically trained veterinarians to meet the needs of our animal industry.

We do not need any additional veterinary colleges. Those we have, eleven in the United States and two in Canada, are believed to be fully adequate for present as well as future needs. What we need is the proper support for the colleges we already have. In this connection it might be well to refer to the clause covering this subject, in the proposed policy now before the Association, as follows:

"States contemplating the establishment of veterinary education are advised to provide scholarships for prospective students that will enable them to attend recognized and qualified institutions already established in other states."

Plan To Go To Des Moines, August 19-22.

ELABORATE CLINIC TO BE HELD AT AMES

A very comprehensive clinic is being planned for the Des Moines meeting of the American Veterinary Medical Association. The clinic will be held at Ames, in the Iowa State College veterinary buildings, which are exceptionally well adapted for the purpose. The program will cover demonstrations and exhibits upon all the animals commonly treated in practice and the subjects will be of interest to practitioners, laboratory men and officials alike. Dr. Bemis, who is in charge of the clinic, and his staff of co-workers have had much experience in arranging clinics and no detail will be left undone to make this one of the most interesting, helpful and educational clinics the A. V. M. A. has ever conducted.

The officers of the Section on General Practice have cooperated in securing contributors of wide reputation. The program will be conducted by demonstrations and exhibits, lasting only 15-30 minutes, before the general assembly, which will be concluded in the middle of the afternoon and then the exhibits will be moved into booths, in which the contributors will stay for some time after the general clinic is over, so that those especially interested in any subject can spend as much time as desired at that booth.

An effort has been made to profit by criticisms of past A. V. M. A. clinics, arranging the work so that no operator will occupy

more than his share of time, and the time of the audience will not be taken up by lengthy discussions over details which may not appeal to the entire assembly. It is to fill this want that the booths are being provided. No veterinarian who attends the Des Moines meeting can afford to miss the clinic. It will be well worth the time spent.

E. R. S.

Have You Secured One New Member This Year?

MORE MILK BEING CONSUMED

Americans are consuming more milk than ever before, according to a recent announcement of the U. S. Department of Agriculture, which stated that the household consumption of milk was 212 quarts per person last year, compared with 200 quarts in 1922.

Consumption of butter was 17 pounds per capita, compared with 16½; of cheese, 3.91 pounds, compared with 3.74; of condensed and evaporated milk, 13.2 pounds, compared with 12.69; and of ice cream, 2.66 gallons, compared with 2.43 gallons.

Milk production was 7,000,000,000 pounds more last year than in 1922, the total output having been 109,736,062,000 pounds.

This ought to set at rest the fears of those who have looked with alarm upon any publicity given to the possible transmissibility of bovine tuberculosis to human beings, through the consumption of milk. It would appear that, if there is any connection at all, the publicity relating to the bovine tuberculosis eradication campaign now in progress has increased, rather than decreased, the confidence of the milk-consuming public.

Does Your Wife Know About The Women's Auxiliary?

MR. STRAUS' PLAN

At the recent Tuberculosis Eradication Conference, held in Albany, N. Y., Hon. Nathan Straus, Jr., of New York City, delivered one of the most impressive addresses of the meeting. The title of his address was, "Milk and Health—Reflections on Fifteen Years' Practical Experience with the Milk Problem." Mr. Straus is a member of the New York State Legislature, and during a recent session of that body, made a proposal for a bond

issue of from twenty to thirty million dollars, the proceeds to be used for the expenses and payment of indemnities incident to a rapid and complete campaign which was to be state-wide and have for its object the testing for tuberculosis of all cattle in the state, and the slaughter of all reactors. Time was to be the essence of the plan, in contrast to the methods at present employed and which, at the present rate of progress, will not bring about the desired end for many years.

After submitting his novel plan, study and investigation revealed that there were two great obstacles standing in its way. No one seriously questioned the advisability of the bond issue from a purely financial standpoint. However, Mr. Straus and his colleagues soon were made to realize the nature of the two deterring factors. First: The fact was brought out that there were not enough veterinarians in the state available to carry on the great amount of testing which would be required. Second: Those in a position to know stated that if all of the cows in the State of New York, affected with tuberculosis, were to be slaughtered within the comparatively short period of time embraced in the plan, a milk famine would be the result.

Surely this is a serious indictment for the live stock sanitary control authorities of any state to have to face. It is safe to say that New York is not alone in this particular. Think, for a minute, just what is implied in the second obstacle to the plan. Several of New York's neighbor states would undoubtedly find themselves in the same predicament. Mr. Straus is to be congratulated upon the originality of his idea, and it is to be hoped that he will be able to work out a substitute plan that will have the same goal as its object, if his original proposal is finally dismissed as being absolutely impractical.

ON TO DES MOINES

BIRD'S-EYE VIEW OF PROGRAM

Monday Aug. 18	Tuesday Aug. 19	Wednesday Aug. 20	Thursday Aug. 21	Friday Aug. 22	Saturday Aug. 23
Meetings of Executive Board and Standing and Special Committees	*Morning* Opening Session	*Morning* Section Meetings	*Morning* General Session	All-day Clinic at Iowa State College, Ames	Visit to Iowa State Fair Special Racing Program
	Afternoon Business Session	*Afternoon* Business Session	*Afternoon* Business Session		
	Evening Alumni Meetings	*Evening* Reception Banquet and Dance	*Evening* Section Meetings		

COMING VETERINARY MEETINGS

Texas Short Course for Graduate Veterinarians. A. and M. College of Texas, College Station, Texas. July 7-12, 1924.

Illinois State Veterinary Medical Association. St. Nicholas Hotel, Springfield, Ill. July 9-10, 1924. Dr. L. A. Merillat, Secretary, 1827 So. Wabash Ave., Chicago, Ill.

Kentucky Veterinary Medical Association. Frankfort, Ky. July 9-10, 1924. Dr. J. A. Winkler, Secretary, Newport, Ky.

Western New York Veterinary Medical Association. Akron, N. Y. July 10, 1924. Dr. F. F. Fehr, Secretary, 243 So. Elmwood Ave., Buffalo, N. Y.

Virginia State Veterinary Medical Association. Ocean View Hotel, Ocean View, Va. July 10-11, 1924. Dr. H. T. Farmer, Secretary, 316 N. Henry St., Richmond, Va.

New Jersey, Veterinary Medical Association of. Asbury Park, N. J. July 10-11, 1924. Dr. P. B. Silvester, Secretary, Princeton, N. J.

Idaho Veterinary Medical Association. Lewiston, Idaho. July 14-15, 1924. Dr. J. D. Adams, Secretary, Boise, Idaho.

South Carolina Association of Veterinarians. Sumter, S. C. July 14-15, 1924. Dr. M. R. Blackstock, Secretary, Spartanburg, S. C.

Oklahoma State Veterinary Medical Association. Medicine Park, Okla. July 14-15-16, 1924. Dr. L. B. Barber, Secretary, 100 Live Stock Exchange, Oklahoma City, Okla.

Southeastern Michigan Veterinary Medical Association. Mount Clemens, Mich. July 15, 1924. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

Maryland State Veterinary Medical Association. College Park, Md. July 17-18, 1924. Dr. E. M. Pickens, Secretary, College Park, Md.

Washington, British Columbia and Oregon Veterinary Medical Associations. Tacoma, Wash. July 29-30-31, 1924.

American Veterinary Medical Association. Fort Des Moines Hotel, Des Moines, Iowa. August 19-20-21-22, 1924. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

STUDIES OF THE VALUE OF VACCINES AND BACTERINS IN IMMUNIZING CATTLE TO BACT. ABORTUS (BANG)[1]

By C. P. FITCH *and* W. L. BOYD

University Farm, St. Paul, Minnesota

A large number of experiments have been conducted to determine the efficiency of biological agents to control infectious abortion of cattle due to *Bact. abortus* (Bang.) The results reported are variable and a definite opinion as to the reliability of such agents cannot be given. Two of the latest publications only will be referred to in this article.

Hart and Carpenter recently reported some controlled experiments as a result of which they state that, "The above experiments clearly demonstrate the value of living cultures of *Bact. abortum* in preventing abortion in the vaccinated animals when subjected to identical infection that produced abortion in the controls." They found also that a number (9) of the vaccinated animals failed to conceive. Smith and Little report the results of an extensive study beginning in 1918. A few of their conclusions are:

"1. In one experiment comprising 134 controls and 53 vaccinated heifers, the abortion rate, following vaccination with living cultures, was 16.7 and 11 per cent respectively for first and second pregnancies as compared with 25.1 and 19.2 per cent for the control groups.

"In a second experiment comprising 35 heifers treated with heated cultures and 10 with living cultures, the combined abortion rate for the first pregnancy was 14.7 per cent as compared with 41.6 per cent for 38 controls. The rate for the 10 treated with living cultures was 0. The above estimates do not include those cases in which full term pregnancies were associated with infected or diseased placentas.

"2. Vaccination with living cultures should be applied only in herds in which abortion in the first pregnancy is frequent and in which cows freshly introduced abort the first or second calf.

"3. Vaccination with small doses of living bacilli (one agar slant or less) practiced 2 to 3 months before conception is not a dangerous procedure."

[1]Published with the approval of the Director as Paper No. 461 of the Journal Series of the Minnesota Agricultural Experiment Station. Received for publication, March 13, 1924.

The work here reported began in May, 1918, and has continued uninterruptedly. It is impossible to give all the details in the protocols of the different animals as space will not permit. We will attempt to outline the more important facts and all details will be cheerfully furnished on request. Later it is planned to bring together all our data on the subject of diseases of the genital tract and publish as a technical bulletin.

The original animals (14) of this experiment were purchased from the stock yards at South St. Paul. They were scrub cattle of fairly good quality. They were brought to University Farm and confined in a small barn but in separate stanchions. They were allowed to run out daily in a small paddock. A larger and more commodious barn was obtained in 1919, and the animals were transferred to it. The hygienic and sanitary conditions, in this latter building, were far above the ordinary.

The animals were divided into three groups. One group was injected with living abortion vaccine, another was given bacterin or "blown up" germs (Larson bacterin) and the third was left as controls. These groups were increased from time to time until the end of the experiment. The majority of the added animals were raised in the herd. The living abortion vaccine and bacterin were prepared from a number of different strains of *Bact. abortus*. During the progress of this work thirty-two strains of *Bact. abortus* have been used. These have all been of bovine source except two which have been of porcine origin. These strains have been of various degress of virulence and have been isolated different lengths of time. We have not observed any marked variation in the immunizing properites of the strains. It is, however, our opinion based on this work that recently isolated and virulent strains are more suitable for the preparation of both vaccines and bacterins.

Smith and Little state that the relative efficiency and danger of recently isolated strains for vaccines is not clear and that the older cultures should be used. We have not observed any harmful effects from the use of virulent strains. We have observed abscessation at the point of injection of the vaccine. Pure cultures of *Bact. abortus* were isolated from the pus. As a rule these abscesses do not require opening and are absorbed. Occasionally where there is extensive pus formation, they may rupture and discharge large numbers of *Bact. abortus* for a week to ten days. Abscesses have followed the injection of strains isolated for long

periods of time as well as the use of those recently isolated and exceedingly virulent.

The living vaccine was prepared by growing *Bact. abortus* on agar, washing off the growth with saline and diluting to approximately the same density as tube 4 of the McFarland nephelometer. The vaccine was injected in every case within a few hours after its preparation. The bacterins were prepared from agar cultures by washing with carbolized (0.5%) saline. The suspension was killed by heating at 56°C., from 30 to 80 minutes. Some strains are much more resistant to heat than others and various lengths of time of exposure have been necessary. The least amount of heating necessary to kill the organisms has always been employed. The suspension of dead bacteria was diluted with carbolized saline until it was approximately of the same density as tube 5 of the McFarland nephelometer. The Larson bacterin was prepared for us by Dr. W. P. Larson, of the University of Minnesota, Medical College. The method of preparation consisted of "blowing up" the bacteria by means of CO_2 pressure, as described by Dr. Larson. Considerable difficulty was experienced in killing *Bact. abortus* by this method and it was finally abandoned.

The vaccine was injected approximately sixty days before breeding. In some animals repeated injections of the vaccine were employed, in others only a single dose. Careful study of the cases fails to show any marked variation in efficiency. The bacterin was injected at various intervals, throughout the life of the individual.

Each animal was carefully observed and, if any medical or surgical attention was needed, this was immediately given. It was the intention throughout the experiment to treat each animal as the occasion demanded. In the table given with each group, the clinical treatments are summarized under none, few, average, and many, so that an opinion can be given as to the general condition of the genital organs of the animal. It should be kept clearly in mind that this clinical attention increased the breeding efficiency of the herd enormously. If no medical or surgical attention had been given, many of the animals would have become incurably sterile and some would have died.

During the first two years of the experiment, what we have termed as "natural infection" was utilized to test the immunity of the animals. Three cows which had recently aborted and were at the time discharging abortion bacteria via their vaginas, were

placed in the same stable and under the same condition as the three groups of cattle. Two of these animals cleaned up and ceased to discharge living abortion bacilli. The other, however, developed an infected udder and remained a constant reactor.

It will be noted from the protocols that few abortions occurred during this period and the check animals remained regative to the agglutination test. Although this method of testing immunity has been employed by a number of investigatiors, we are of the opinion that it is often unreliable, even though the check animals should become infected and some of them abort. Following this period, artificial methods of infection were used. The animals were drenched with suspensions of live *Bact. abortus* and some individuals were injected intravenously with similar suspensions. These suspensions were prepared by washing the growth from agar-slant cultures with saline solution. They were always administered immediately after washing. The growth from six large tubes (2½ centimeters in diameter) was used for each drench. For the intravenous inoculations, a suspension of the same density as the living vaccine was used. The stomach contents and fetal fluids of aborted fetuses were employed for drenching as they were available. Each fetus was examined bacteriologically and *Bact. abortus* isolated in every case.

Frequent examinations of the milk of each animal for the presence of *Bact. abortus* were made by intraperitoneal inoculations of guinea pigs. Microscopic examination and guinea pig inoculations were carried out on each placenta. The blood of the animals was tested by the agglutination test at frequent intervals, for the presence of antibodies of *Bact. abortus*. The important results of these tests are included in the protocols and tables.

All but two of the animals have been slaughtered and a careful histological and bacteriological examination made of the genital tract, adjacent lymph nodes and udder. The bacteriological results of such examinations are given as above.

Two bulls have been used in the herd. Each was secured as a young calf and raised in the herd. Bull 291, the first one used, was born Dec. 5, 1917, and slaughtered Oct. 5, 1921. Frequent agglutination tests made of this animal were always negative for *Bact. abortus* antibodies. The second bull (878) was born Jan. 24, 1921, and is still alive. This animal also has never shown evidence of infection with *Bact. abortus*. These bulls have been used exclusively on the experiment animals and no particular

efforts have been made to prevent infection of the male. Of course he has been confined in a separate stall, but in the same barn as the other cattle. Douching of the prepuce has not been employed.

GROUP I.

ANIMALS INJECTED WITH LIVING VACCINE

No. 278

Heifer purchased at South St. Paul, May 20, 1918. Approximately seven months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 20 cc of living abortion vaccine, July 3, July 19, July 31 and August 15, 1918. Agglutination test, September 1, 1918, positive. Bred, December 2, 1918, to bull 291. Calved normally, September 8, 1919. Injected subcutaneously with 20 cc of living abortion vaccine on October 31, 1919. Bred, December 7, 1919, to bull 291. Calved normally, September 10, 1920. Bred, November 18, 1920, to bull 291. Examined, January 17, 1921, and found pregnant. On March 10, March 31, May 6, and June 22, 1921, drenched with a suspension of living organisms. Calved normally, August 28, 1921. Agglutination test, July 23, 1921, positive. Injected subcutaneously, September 27, 1921, with 20 cc of living abortion vaccine. Bred, December 5, and December 26, 1921, to bull 878. Examined, March 8, 1922, and found in calf. Drenched with stomach contents of an aborted fetus, March 13 and April 26, 1922. Calved, October 10, 1922. Had metritis, retention of fetal membranes and cervicitis. Bred, December 27, 1922, February 13, March 5 and May 11, 1923, to bull 878. Did not conceive. Slaughtered, July 3, 1923. Bacteriological examination of the genital tract indicated that the active infection had subsided. All the cultures were sterile except from the cervix which showed growth of a white coccus and *B. subtilis*. *Bact. abortus* not found in the milk.

No. 279

Heifer purchased at South St. Paul, May 20, 1918. Approximately seven months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 20 cc suspension of living abortion vaccine, July 3, July 19, July 31 and August 15, 1918. Agglutination test, September 1, 1918, positive. Bred, November 2 and December 31, 1918, to bull 291. Calved normally, October 9, 1919. Calf developed white scours but lived. Injected subcutaneously with 20 cc of suspension of living abortion vaccine on October 31, 1919, and again on March 24, 1920. Bred, May 22, 1920, to bull 291. Calved March 5, 1921. Calf developed white scours and died, March 10, 1920. Cultures from calf showed presence of *B. coli*. Cow injected subcutaneously with 40 cc of living abortion vaccine, April 25, 1921. Bred, July 26, 1921, to bull 291. Examined and found pregnant, September 27, 1921. Injected intravenously on this date with 10 cc of a suspension of living abortion bacteria. Calved normally, May 2, 1922. Bred, July 25, 1922, to bull 878. Examined, September 11, 1922. Not in calf. Bred, October 1, 1922, to bull 878. Examined, December 2, 1922, and found in calf. Killed, April 27, 1923. Blood positive to agglutination test on day of slaughter. All fetal and maternal membranes appeared normal. Cultures and guinea pig inoculations from fetus and maternal genitalia showed no evidence of any invading organism. *Bact. abortus* not found in the milk.

No. 280

Heifer purchased at South St. Paul, May 20, 1918. Approximately four months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 20 cc of living abortion vaccine, July 3, July 19, July 31 and September 1, 1918. Bred, November 23, 1918, to bull 291. Aborted, June 30, 1919. Agglutination tests, September 1, 1918, and November 8, 1919, positive. Cultures from fetus remained sterile. These cultures were made on hormone-agar which we have found on further investigation not to be suitable for growing *Bact. abortus*. Cow retained her fetal membranes. Bred, July 27, November 8, and December 20, 1919, to bull 291. Calved, September 28, 1920. Calf developed scours and died, October 2, 1920. Cow slaughtered,

October 21, 1920. The genital tract was found to have completed the act of involution and was apparently normal. Cultures from the genitalia showed *Staphylococcus albus* and *Staphylococcus aureus* from the right and left cornua. *Bact. abortus* not found in the milk.

No. 282

Heifer purchased at South St. Paul, May 20, 1918. Approximately six months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 20 cc of living abortion vaccine, July 3, July 19, July 31 and August 15, 1918. Agglutination test, September 1, 1918, positive. Bred, January 4, January 24, February 13, April 14, May 26, June 13, July 4, July 25, and October 8, 1919, to bull 291. Agglutination test, November 18, 1919, negative. This animal was slaughtered November 18, 1919, because she was tuberculous. Autopsy showed she was about forty days pregnant. No evidence of disease or invading organism of genitalia was found.

No. 286

Heifer purchased at South St. Paul, May 20, 1918. Approximately five months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 20 cc of living abortion vaccine on July 3, July 19, July 31, August 15, 1918. Bred, December 16, 1918, to bull 291. Calved normally, September 18, 1919. Agglutination test, September 1, 1918, positive. Injected subcutaneously with 20 cc of living abortion vaccine, October 31, 1918. Bred, February 11, 1920, to bull 291. Calved normally, November 14, 1920. Injected subcutaneously with 20 cc of living abortion vaccine, February 21, 1921. Bred, April 17, 1921. Examined, June 21, 1921, and found pregnant. Injected intravenously on June 27, 1921, with 10 cc of suspension of live *Bact. abortus*. Aborted, August 23, 1921. *Bact. abortus* recovered from the fetus. Injected subcutaneously with 20 cc of living abortion vaccine, September 27, 1921. Bred, December 6 and December 27, 1921, to bull 878. Examined, March 8, 1922, and found in calf. Injected intravenously, May 1, 1922, with 5 cc of suspension of living *Bact. abortus*. Aborted, July 9, 1922, and *Bact. abortus* recovered from the fetus. Bred, August 18, October 12, October 31, November 25, 1922 and January 21, and February 12, 1923, to bull 878. Agglutination test, January 24, 1923, positive. Examined, March 24, 1923, and found not in calf. Killed, March 29, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* found in the milk.

No. 288

Heifer purchased at South St. Paul, May 20, 1918. Approximately five months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 20 cc of living abortion vaccine, July 3, July 19, July 31, and August 15, 1918. Bred, October 29, 1918. Calved normally, July 29, 1919. Agglutination test, September 1, 1918, positive. Injected subcutaneously with 20 cc of living abortion vaccine, September 4, 1919. Bred, January 15, February 20, April 3, May 12, June 25, September 24, 1920, and February 28, 1921, to bull 291. Examined, April 5, 1921, and found to be pregnant. Agglutination test, March 31, 1921, negative. Injected intravenously on May 12, 1921, with 10 cc suspension of living *Bact. abortus*. Examined August 1, 1921, and found not pregnant. This animal undoubtedly aborted and the fetus was lost. Agglutination test, August 12, 1921, positive. Injected subcutaneously, September 27, 1921, with 20 cc of living abortion vaccine. Bred, December 20, 1921, and January 12, 1922, to bull 878. Examined, March 8, 1922, and found in calf. Injected intravenously, May 1, 1922, with 5 cc of a suspension of live *Bact. abortus*. Aborted, June 29, 1922. *Bact. abortus* isolated from the fetus. Bred, July 25, September 13, December 27, 1922, and February 12, 1923, to bull 878. Did not conceive. Slaughtered, March 8, 1923. Bacteriological examination of entire genital tract showed no pathogenic bacteria present.

No. 4

Heifer born January 25, 1921. Dam is 283. Agglutination test March 31, 1921, negative. Injected subcutaneously with 20 cc of living abortion vaccine February 1, 1922. Bred, April 14, 1922, to bull 878. Examined, July 9, 1922, and found pregnant. Drenched with a suspension of live abortion bacteria,

August 16, 1922. Agglutination test November 6, 1922, positive. Calved January 14, 1923. Bred, March 5, 1923, to bull 878. Killed, April 6, 1923, and found to be pregnant. Cultures from entire genital tract remained sterile. *Bact. abortus* found in the milk.

No. 5

Heifer born November 14, 1920. Dam is 286. Agglutination test, March 31, 1921, negative. Injected subcutaneously with 20 cc of living abortion vaccine, November 25, 1921. Bred, January 29, 1922, to bull 878. Examined, March 8, 1922, and found in calf. Drenched May 1, 1922, with a suspension of living *Bact. abortus*. Agglutination test, July 31, 1922, positive. Calved, October 22, 1922. Bred, December 18, 1922, March 7, April 17, 1923, to bull 878. Examined, June 15, 1923, and found in calf. Killed, July 2, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* found in the milk.

No. 9

Heifer born May 29, 1920. Dam is 289. Agglutination test, March 31, 1921, negative. Injected subcutaneously, June 27, 1921, with 20 cc of living abortion vaccine. Bred, August 25, 1921, to a Shorthorn bull. Examined, October 21, 1921, and found in calf. Drenched, January 3, 1922, with stomach contents of aborted fetus. Agglutination test, February 7, 1922, positive. Calved normally, May 29, 1922. Bred, July 26, September 27, and October 26, 1922, to bull 878. Examined, December 21, 1922, and found in calf. Drenched, February 12, 1923, with stomach contents of aborted fetus. Calved normally, July 30, 1923. Blood test, August 14, 1923, negative. Cow slaughtered, August 24, 1923. Cultures from genital tract remained sterile. *Bact. abortus* not found in the milk.

No. 13

Heifer born September 23, 1920. Came into our herd, April 23, 1921. Agglutination test, July 23, 1921, negative. September 27, 1921, injected subcutaneously with 20 cc of living abortion vaccine. Bred, January 17, 1922, to bull 878. Examined, March 8, 1922, and found to be in calf. Drenched, May 1, 1922, with a suspension of living *Bact. abortus*. Agglutination test, July 31, 1922, positive. Calved normally, October 20, 1922. Cow developed metritis. Bred, December 8, 1922, and January 24, 1923, to bull 878. Examined, March 23, 1923, and found in calf. Drenched with a suspension of live abortion bacteria, August 14, 1923. Calved, October 10, 1923. Placenta and milk have not contained *Bact. abortus*.

No. 15

Heifer born April 9, 1921. Agglutination test, July 23, 1921, negative. Injected subcutaneously, March 25, 1923, with 10 cc of living abortion vaccine. Agglutination test, April 12, 1922, positive. Bred, July 7, October 24, 1922, and January 26, 1923, to bull 878. This animal developed cystic degeneration of the ovaries and salpingitis and was killed, February 17, 1923. Bacteriological examination of genital tract showed *Staphylococcus pyogenes*.

GROUP II.

ANIMALS INJECTED WITH LARSON AND ORDINARY BACTERIN

No. 276

Heifer purchased at South St. Paul, May 20, 1918. Approximately 5 months old. Agglutination test, June 27, 1918, negative. Injected with 10 cc of Larson bacterin, July 20, August 9, August 30, October 24, 1918, January 8 and March 12, 1919. Agglutination test, September 1, 1918, positive. This animal did not come in heat. March 6, 1919, she was examined per rectum and found to have very small and undeveloped genital organs. Animal killed, April 15, 1919. Examination of genital organs showed small and undeveloped ovaries and uterus. Cultures made from these organs remained sterile.

No. 277

Heifer purchased at South St. Paul, May 20, 1918. Approximately four months old. Agglutination test, June 27, 1918, negative. Injected with 10 cc of abortion bacterin, August 9, September 25 ,November 16, 1918; January 11, April 7, June 5, September 4, 1919; January 20, April 12 and June 8, 1920.

TABLE I—SUMMARY OF RESULTS ON ANIMALS INJECTED WITH LIVING VACCINE

Cow	Pregnancies	Services	Age (Years)	Abortions	Healthy Calves	Calves with Scours	Clinical Treatments	*Bact. abortus* isolated from placenta or milk	Condition of genital tract and results of bacteriological examination of same at time of slaughter
278	4	9	5-6	0	4	0	Many	Milk negative Placenta not examined	Fair Sterile
279	4	6	5-6	0	1	2	Few	Milk negative Placenta negative	Pregnant Sterile
280	2	3	2-3	1	0	1	None	Milk negative Placenta negative	Excellent Sterile
282	1	9	1-2	0	0	0	Few	Milk none available Placenta negative	Pregnant Sterile
286	4	11	5-6	2	2	0	Average	Milk positive Placenta positive	Bad Sterile
288	3	14	5-6	2	1	0	Many	Milk not examined Placenta positive	Bad Sterile
4	2	2	2-3	0	1	0	Many	Milk positive Placenta negative	Pregnant Sterile
5	2	4	2-3	0	1	0	Many	Milk positive Placenta positive	Pregnant Sterile
9	2	4	3-4	0	2	0	None	Milk negative Placenta negative	Excellent Sterile
13	2	3	3	0	2	0	Many	Milk negative Placenta negative	Still alive
15	0	3	1-2	0	0	0	Many	None available	Good *Staphylococcus pyogenes*
Total	26	68	Average—3.5 years	5	14	3			

Treatments are grouped under: none, few, average, many.
Condition is grouped under: excellent, good, fair, bad.

Agglutination test, September 1, 1918, positive. Bred, December 4, 1918, to bull 291. Calved normally, September 8, 1919. Bred to same bull, December 6 and December 27, 1919, and calved normally, October 9, 1920. Injected subcutaneously with 10 cc of abortion bacterin, September 11, 1920 and January 10, 1921. Bred to bull 291, December 11, 1920. Examined and found pregnant, February 19, 1921. Oh March 10, 1921, injected saline suspension of living *Bact. abortus* from two agar-slant cultures into the jugular vein. Aborted, June 18, 1921. *Bact. abortus* isolated from the fetus. Bred, August 5, 1921, to bull 291. Examined and found pregnant, September 27, 1921. On same date was injected intravenously with 10 cc of living *Bact. abortus*. Injected subcutaneously with 10 cc of abortion bacterin, October 10, 1921, February 7, 1922, and May 8, 1922. Calved nomally, May 10, 1922. Bred, June 20, to bull 878. Examined and found in calf, July 25, 1922. On October 26, 1922, injected intravenously with a suspension of 10 cc of living *Bact. abortus*. Injected subcutaneously with 20 cc of abortion bacterin, October 27, 1922, and February 5, 1923. Cow aborted, December 30, 1922. Pure culture of *Bact. abortus* recovered from the fetus. Animal developed pyometra. Killed, March 20, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* found in milk.

No. 281

Heifer purchased at South St. Paul, May 20, 1918. Approximately four months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 10 cc of bacterin, August 9, September 25, and November 16, 1918. Agglutination test, September 1, 1918, positive. Bred, December 12, 1918, to bull 291. Injected subcutaneously with 10 cc of bacterin, January 11th, April 7, June 15, and September 4, 1919. Calved normally, September 17, 1919. Agglutination test, September 19, 1919, positive. Calf developed scours and was destroyed, October 18, 1919. Cow bred to bull 291, November 22, 1919. Injected subcutaneously with 10 cc of bacterin, January 20, April 12 and June 8, 1920. Calved normally, August 31, 1920. Agglutination test, August 13, 1920, positive. Injected subcutaneously with 10 cc of bacterin, September 11, 1920, January 10, April 15, and August 19, 1921. Cow bred to bull 291, December 7, 1920. Examined and found in calf, February 19, 1921. Drenched with a suspension of living *Bact. abortus* prepared by washing the growth from six agar-slant cultures on March 10, March 31, May 6, and June 22, 1921, respectively. Agglutination test, July 9, 1921, positive. Calved normally, September 7, 1921. Injected subcutaneously with bacterin, October 10, 1921 and February 7, 1922. Bred, October 19, and November 7, 1921, to bull 878. Examined, January 16, 1922, and found to be in calf. Injected intravenously, February 7, 1922, with 10 cc of a suspension of living *Bact. abortus*. Examined, March 7, 1922, and small fetus found in vagina. *Bact. abortus* isolated from the fetus. Animal bred, April 3, June 26, August 9, September 21, November 6, November 26, December 27, 1922, January 15, 1923, to bull 878. Injected subcutaneously with 20 cc of bacterin May 8, October 27, 1922, and February 5, 1923. Examined, March 22, 1923. Not in calf. Slaughtered, March 23, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* found in milk.

No. 283

Heifer purchased at South St. Paul, May 20, 1918. Approximately five months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 10 cc of Larson bacterin, July 20, Aug. 9, Aug. 30, Oct. 24, 1918; Jan. 8, Mar. 12 and June 27, 1919. Bred, Jan. 2, 1919, to bull 291. Calved normally, Oct. 12, 1919. Injected subcutaneously with 10 cc of Larson bacterin, Oct. 14, 1919, Mar. 3, and July 14, 1920. Injected subcutaneously with 10 cc of bacterin, Nov. 11, 1920. Agglutination test, Mar. 9, 1920, positive. Bred, April 10 and May 14, 1920, to bull 291. Calved, Jan. 25, 1921. Had retained fetal membranes as a result of severe metritis. Injected subcutaneously with 10 cc of bacterin, Apr. 25, Aug. 19, Oct. 10, 1921. Bred, April 30 and July 26, 1921, to bull 291. Examined, Sept. 27, 1921, and found to be pregnant. On this latter date injected intravenously with 10 cc of suspension of living *Bact. abortus*. Aborted, Nov. 16, 1921. *Bact. abortus* recovered from the fetus. Cow retained the placenta and later developed pyo-

metra and cystic changes of the ovaries. Injected subcutaneously with 10 cc of bacterin, Feb. 7, May 8, 1922; also similarly injected with 20 cc of bacterin on Oct. 27, 1922, and Feb. 5, 1923. Bred, Jan. 21, May 18 and June 11, 1922, to bull 878. Examined, Sept. 11, 1922, and found pregnant. Drenched, Oct. 31, 1922, with a suspension of live abortion bacteria. Calved, Mar. 8, 1923. Calf O. K. Cow slaughtered, Apr. 9, 1923. A large abscess was found in the uterine wall. Bacteriological examination of the genitalia showed *B. coli communis*, *Staphylococcus pyogenes albus* and a streptococcus of the alpha type. *Bact. abortus* not found in the milk.

No. 284

Heifer purchased at South St. Paul, May 20, 1918. Approximately seven months old. Agglutination test, June 27, 1918, negative. Injected subcutaneously with 10 cc of bacterin on Aug. 9, Sept. 25, Nov. 16, 1918 and Jan. 11, April 7, and June 15, 1919. Bred, Nov. 24, 1918, to bull 291. Calved normally Aug. 23, 1919. Calf developed scours but recovered. Agglutination test positive, Aug. 26, 1919. Injected subcutaneously with 10 cc of bacterin on Sept. 4, 1919, Jan. 20, Apr. 12, June 8, Sept. 11, 1920. Bred, Dec. 18, 1919, to bull 291; also bred to same bull, Apr. 6, July 14, Aug. 14, 1920. She did not conceive and was slaughtered as a tuberculin reactor, Oct. 8, 1920. Cultures from the genital tract showed *Staphylococcus pyogenes aureus* and *albus*. *Bact. abortus* not found in milk.

No. 289

Heifer calf obtained from beef herd at University Farm, May 18, 1918. Injected with 10 cc of Larson bacterin July 20, Aug. 9, Aug. 30, Oct. 24, 1918 and Jan. 8, Mar. 12, June 27, Oct. 14, 1919 and Mar. 3, 1920. Agglutination test, Sept. 1, 1918, negative, Nov. 22, 1919, negative and Mar. 9, 1920 positive. Bred, July 21, 1919, to bull 291. Calved normally, May 29, 1920. Injected with 10 cc of Larson bacterin, July 14, 1920. Bred, Aug. 17, 1920, to bull 291. Injected with 10 cc. of bacterin, Nov. 11, 1920. Calved normally, May 30, 1921. Calf died of scours. Bred, July 16, 1921, to bull 291. Injected with 10 cc of bacterin, Aug. 19, Oct. 10, 1921 and Feb. 7, 1922. Examined and found in calf, Sept. 3, 1921. Drenched with a suspension of living abortion bacteria, Sept. 27, 1921. Drenched with stomach contents of an aborted fetus, Dec. 24, 1921. Aborted a living calf, Mar. 23, 1922. *Bact. abortus* isolated from the placenta. Calf died, Mar. 26, 1922. Cow bred, Apr. 16, July 9, Aug. 22, 1922, to bull 878. Injected subcutaneously with 10 cc of bacterin, May 8, and with 20 cc ,Oct. 27, 1922, and Feb. 5, 1923. Examined Oct. 23, 1922, and found in calf. Nov. 6, 1922, drenched with a suspension of living abortion bacteria. Aborted Feb. 11, 1923. *Bact. abortus* recovered from the fetus. Cow killed Mar. 2, 1923. *Bact. abortus* isolated from the uterus. *Bact. abortus* found in the milk.

No. 301

Heifer calf born Sept. 8, 1919. Dam is No. 277. Agglutination test, Sept. 11, 1919, negative. Injected subcutaneously with 10 cc of bacterin Jan. 20, Apr. 12, June 8, Sept. 11, 1920, and Jan. 10, Apr. 25, June 23, Aug. 10, Oct. 10, 1921. Agglutination test, Nov. 1, 1921, positive. Bred, Nov. 27, Dec. 15, 1920, and Jan. 17, Feb. 28, Mar. 18, 1921, to bull 291. Calved, Nov. 28, 1921. Suffered dystocia and had retained placenta. Calf died, Dec. 2, 1921. Injected subcutaneously with 10 cc of abortion bacterin, Feb. 7, May 8, and with 20 cc, Oct. 27, 1922. Bred, Mar. 23, 1922, to bull 878. Examined, May 17, 1922, and found pregnant. Drenched, June 1, 1922, with stomach contents of aborted fetus. Injected with 20 cc of bacterin, Oct. 27, 1922, and Feb. 5, 1923. Calved normally, Dec. 27, 1922. Calf lived and did well. Cow killed, Feb. 27, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* found in the milk.

No. 1

Heifer purchased at South St. Paul, Jan. 14, 1921. Approximately three months old. Agglutination test, March 31, 1921, negative. Injected subcutaneously with 10 cc of bacterin, June 23, Aug. 19, Oct. 10, 1921; Feb. 7 and May 8, 1923. Bred, Jan. 22, 1922, to bull 878. Examined, Mar. 8, 1922, and found to be in calf. Drenched with stomach contents of aborted fetus, Apr.

26, 1922. Agglutination test, July 31, 1922, positive. Calved, Oct. 15, 1922. Suffered with placentitis and later pyometra. Injected with 20 cc of bacterin subcutaneously, Oct. 27, 1922. Cow developed extensive changes of genital tract and was slaughtered, Jan. 31, 1923. *Bacillus pyogenes* isolated from various parts of the genital organs. *Bact. abortus* not found in the milk.

No. 2

Heifer purchased at South St. Paul, Dec. 10, 1920. Approximately three months old. Agglutination test, Mar. 31, 1921, negative. Injected subcutaneously with 10 cc of abortion bacterin, June 23, Aug. 19, Oct. 10, 1921, and Feb. 7, 1922. Bred, Oct. 3, 1921, to bull 878. Examined and found in calf, Dec. 6, 1921. Drenched with stomach contents of aborted fetus, Jan. 3, 1922. Agglutination test, Feb. 7, 1922, positive. Aborted, Apr. 25, 1922. *Bact. abortus* isolated in pure culture from fetus and placenta. Injected subcutaneously with 10 cc of bacterin, May 8, 1922, and with 20 cc, Oct. 27, 1922, and Feb 5, 1923. Bred, June 10, July 23, Aug. 21, Sept. 27, Oct. 21, Nov. 14, Dec. 13, 1922, Jan. 12, Feb. 13, 1923, to bull 878. Did not conceive. Slaughtered, Apr. 4, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* not found in the milk.

No. 8

Cow came into our herd about Jan. 1, 1921. Had following history: Born, Sept. 26, 1916. Bred first, Feb. 18, 1918. Aborted in pasture, Oct. 10, 1918. Served, Dec. 9, 1918, Mar. 20, April 19, May 16, and June 5, 1919. Aborted, Jan. 20, 1920. Served, May 11 and June 17, 1920. Aborted, Dec. 15, 1920. Bred in our herd, by bull 291, Feb. 4, Apr. 2, and Apr. 26, 1921. Agglutination test, Mar. 31, 1921, positive. Aborted, Nov. 26, 1921, and *Bact. abortus* isolated from the fetus. Injected subcutaneously with 10 cc of abortion bacterin on Feb. 7, 1922, May 8, 1922, and with 20 cc, Oct. 27, 1922, and Feb. 5, 1923. Bred, Feb. 13, Mar. 25, June 16, 1922, to bull 878. Cow developed hydrops amnii and a dead fetus was delivered, Feb. 8, 1923. Cultures prepared from fetal stomach contents all showed pure culture of *B. subtilis*. Two guinea pigs injected with the stomach contents were killed, Mar. 3, 1923. Pure cultures of *B. subtilis* were isolated from the spleens of both pigs. Cow slaughtered, Mar. 27, 1923. Cultures from the genital tract remained sterile. *Bact. abortus* not found in the milk.

No. 12

Heifer born Sept. 24, 1920. Agglutination test, July 23, 1921, suspicious, and April 12, 1922, positive. Injected with 10 cc of abortion bacterin, June 21, Oct. 10, 1921 and Feb. 7, and May 8, 1922. Bred, Dec. 12, 1921, to bull 878. Examined, Jan. 27, 1922, and found in calf. Drenched with a suspension of living *Bact. abortus*, Feb. 5, 1922. Calved normally, Sept. 7, 1922. Bred, Sept. 22, Sept. 28, Dec. 1, 1922, to bull 878. Examined, Jan. 18, 1923, and found in calf. Injected subcutaneously with 20 cc of abortion bacterin on Oct. 27, 1922. Drenched, Mar. 7, 1923, with a suspension of living *Bact. abortus*. Dropped live calf, Aug. 2, 1923. No evidence of *Bact. abortus* was found in the placenta by guinea pig inoculation. Agglutination test, Aug. 2, 1922, positive. Cow killed, Aug. 27, 1923. A pure culture of *B. pyogenes* isolated from the uterus. *Bact. abortus* found in the milk.

GROUP III.

CHECK ANIMALS

No. 285

Heifer purchased at South St. Paul, May 20, 1918. Approximately six months old. Agglutination test, June 27, 1918, negative. Bred, December 3, 1918, to bull 291. Calved normally, Sept. 8, 1919. Calf developed scours but lived. Agglutination test, Sept. 11, 1919, suspicious. Bred, December 7, 1919, to bull 291. Calved normally, Sept. 18, 1920. Agglutination test, Sept. 19, 1920, negative. Bred, December 3, 1920, to bull 291. Examined and found pregnant, Feb. 19, 1921. On March 10, 1921, injected intravenously with a suspension of living abortion bacteria, prepared from the growth of two agar-slant cultures. Aborted, Apr. 13, 1921. *Bact. abortus* isolated from the fetus. Agglutination test, Mar. 31, 1921, positive. Bred, May 23, Aug. 13, Sept. 11, to bull 291 and on Nov. 6, Nov. 27, 1921 and Feb. 2, 1922, to bull

TABLE II—SUMMARY OF RESULTS ON ANIMALS INJECTED WITH LARSON AND ORDINARY BACTERIN

Cow	Pregnancies	Services	Age (Years)	Abortions	Healthy Calves	Calves with Scours	Clinical Treatments	*Bact. abortus* isolated from milk or placenta	Condition of genital tract and results of bacteriological examination of same at time of slaughter
276	0	0	1–2	0	0	0	Few	None available	Undeveloped Sterile
277	5	6	5–6	2	3	0	Many	Milk positive Placenta positive	Good Sterile
281	4	13	5–6	1	2	1	Few	Milk positive Placenta positive	Fair Sterile
283	4	8	5–6	1	3	0	Many	Milk negative Placenta positive	Bad. Streptococci, *B. coli* & Staphylococci
284	1	4	3	0	0	1	Few	Milk negative Placenta not examined	Good Staphylococci
289	4	6	5	2	1	1	Few	Milk positive Placenta positive	Good *Bact. abortus*
301	2	7	3–4	0	1	1	Many	Milk positive Placenta negative	Good Sterile
1	1	1	3	0	1	0	Many	Milk negative Placenta negative	Bad *B. pyogenes*
2	1	10	2–3	1	0	0	Many	Milk negative Placenta positive	Excellent Sterile
8	2	6	During a 2 year interval	2	0	0	Many	Milk negative Placenta positive *B. subtilis*	Fair Sterile
12	2	4	3	0	2	0	None	Milk positive Placenta negative	Fair *B. pyogenes*
Total	26	64	Average—3.7 Yrs.	9	13	4			

878. Examined, Mar. 22, 1922, and found pregnant. Drenched, May 17, 1922, with stomach contents and other fluids of an aborted fetus. Calved twins, Nov. 6, 1922. Fetal membranes retained. Both calves died. Jan. 21, 1923, bred to bull 878. Examined, Mar. 23, 1923, and found in calf. Killed Apr. 13, 1923. Fetus and genitalia failed to show any organisms on bacteriological examination. *Bact. abortus* not found in the milk.

No. 287

Heifer purchased at South St. Paul, May 20, 1918. Approximately six months old. Agglutination test, June 27, 1918, negative. Bred, December 30, 1918, to bull 291. Examined, Feb. 15, 1919, and found pregnant. Examined again, April 7, 1919, and found not pregnant. Noted to have had blood on hind quarters two weeks previously. This animal may possibly have aborted. Agglutination test, Nov. 22, 1919, negative. Bred, Apr. 7 and June 2, 1919, to bull 291. Calved normally, Mar. 4, 1920. Bred, May 10, 1920, to bull 291. Calved normally, Feb. 15, 1921. Agglutination test, Feb. 15, 1921, negative. Cow killed, Mar. 4, 1921. Had a vaginal discharge ever since calving. Bacteriological examination showed *Streptococcus viridans* and *Staphylococcus albus* and *aureus*. *Bact. abortus* not found in the milk.

No. 3

Heifer purchased at South St. Paul, Dec. 10, 1920. Approximately three months old. Agglutination test, Mar. 31, 1921, negative. Bred, Jan. 22, 1922, to bull 878. Examined, Mar. 8, 1922, and found in calf. Drenched with stomach contents of aborted fetus, May 8, 1922. Agglutination test, July 31, 1922, negative. Drenched with a suspension of live abortion bacteria, Aug. 16, 1922. Calved, Oct. 30, 1922. Agglutination test, Oct. 30, 1922, negative. Also negative on Jan. 29, 1923. Cow had retained placenta as a result of metritis and later suffered with ovaritis. Bred, Jan. 8, 1923, to bull 878. Did not conceive, and was slaughtered Mar. 6, 1923. Cultures from entire genital tract remained sterile. *Bact. abortus* not found in the milk.

No. 6

Heifer born Nov. 12, 1920. Dam is 21492. Agglutination test, Mar. 31, 1921, negative. Bred, Jan. 3, 1922, to bull 878. Examined, Mar. 8, 1922, and found in calf. Drenched, May 1, 1922, with a suspension of living *Bact. abortus*. Agglutination test, July 31, 1922, weakly positive. Calved normally, Oct. 5, 1922. Developed a mild metritis. Bred, Dec. 18, 1922, to bull 878. Examined, Feb. 12, 1923, and found pregnant. This animal was drenched at two different times with stomach contents of aborted fetuses. In each instance, however, bacteriological examination failed to show the presence of *Bact. abortus* in the stomach contents. Calved normally, Sept. 14, 1923. Agglutination test, Aug. 14, 1923, negative. *Bact. abortus* not found in the milk.

No. 10

Heifer born Aug. 31, 1920. Dam is 281. Agglutination test, Mar. 31, 1921, negative. Bred, Sept. 21, Oct. 11 and Nov. 22, 1921, to bull 878. Examined Jan. 3, 1922, and found in calf. Drenched Feb. 7, 1922 with a suspension of living *Bact. abortus*. Aborted June 1, 1922. *Bact. abortus* isolated in pure culture, from the fetus. Agglutination test, June 1, 1922, positive. Bred, Sept. 3, 1923, to bull 878. Examined, Oct. 23, 1922, and found in calf. Drenched, Feb. 12, 1923, with stomach contents of aborted fetus. Agglutination test, Mar. 22, 1923, positive. Calved normally, June 9, 1923. Cow slaughtered July 3, 1923. Cultures from genital tract remained sterile. *Bact. abortus* not found in the milk.

No. 16

Heifer born Aug. 28, 1921. Dam is 278. Agglutination test, Oct. 23, 1921, negative. Bred, Sept. 13, 1922, to bull 878. Examined, Oct. 23, 1922, and found in calf. Drenched, Jan. 1, 1923, with stomach contents of aborted fetus. Agglutination test, Mar. 29, 1923, negative. Calved, June 6, 1923. Developed several abscesses and was killed, July 2, 1923. Bacteriological examination showed pure culture of *B. coli communior* from abscess of right ovary, a streptococcus of the alpha type and *B. coli communior* from the perimetrial abscess.

TABLE III—SUMMARY OF RESULTS ON CHECK ANIMALS

Cow	Pregnancies	Services	Age (Years)	Abortions	Healthy Calves	Calves with Scours	Clinical Treatments	*Bact. abortus* isolated from milk or placenta	Condition of genital tract and results of bacteriological examination of same at time of slaughter
285	5	10	5–6	1	2	1	Many	Milk negative Placenta positive	Pregnant Sterile
287	3	4	3–4	1	1	1	Few	Milk negative Placenta not examined	Fair *Streptococcus viridans, Staphylococcus albus* and *aureus*
3	1	2	2-3	0	1	0	Average	Milk positive Placenta negative	Good Sterile
6	2	2	3	0	2	0	Few	Milk positive Placenta negative	Not yet slaughtered
10	2	4	3	1	1	0	Average	Milk negative Placenta positive	Fair Sterile
16	1	1	2	0	1	0	Many	Milk negative Placenta negative	Bad *B. coli communior* *Streptococcus*
17	1	1	1–2	0	0	0	None	Milk, none available Placenta negative	Pregnant Increased amniotic fluid Sterile
Total	15	24	Average—3 Yrs.	3	8	2			

A few colonies of *Staphylococcus pyogenes albus* from the uterus. Agglutination test, June 25, 1923, negative. *Bact. abortus* not found in the milk.

No. 17

Heifer born Sept. 7, 1921. Dam is 281. Agglutination test, Feb. 7, 1922, negative. Bred, Sept. 28, 1922, to bull 878. Examined, Dec. 2, 1923, and found in calf. Drenched, Feb. 10, 1923, with stomach contents of aborted fetus. Agglutination test, Apr. 19, 1923, negative. This animal never developed properly and remained stunted. She had an attack of pneumonia early in calfhood. She was getting weaker and was killed, Apr. 19, 1923. Autopsy showed increased amniotic fluid, parenchymatous degeneration of the kidneys, and evidences of an old pneumonia. Fetus had large goitre. Bacteriological examination failed to show any infection of the maternal genital organs or the fetus.

Discussion

The most apparent fact brought out by these experiments would seem to be a lack of definite results. On the other hand several important things have been shown. A careful study of each animal shows that there is a marked difference in individual susceptibility or, possibly, what is more likely, a variation in the ability to become immune to the effects of the Bang organism. We are of the opinion that this explains many of the apparent discrepancies in the results obtained in the three groups of animals rather than the variation in immunizing or pathogenic properties of the different strains of the organism employed. We recognize the fact, however, that this latter condition must be considered as a factor and it is for this reason that many different strains were employed. Animal 279, in group I, never aborted even after an intravenous injection of the living germs. Animal 286 aborted twice under essentially the same conditions. Animal 279 did not become a carrier of the germ in her udder while 286 did. The sera of both animals reacted positively to the agglutination test. Animals 4 and 5 of this same group did not abort but both became carriers of the germ in the udder. Animal 12, under the same conditions and treatment, did not abort nor become a chronic carrier and at the time of slaughter her blood test was negative.

The results show that a greater degree of immunity was induced by the living virus than by the bacterin. For example, no abortion occurred in group I, following drenching, while three abortions occurred in group II, following this method of infection. The bacterin was injected more frequently than ordinarily practiced, but we believe this is necessary in order to get the best results. There is no doubt in our minds that some immunity is induced by the use of bacterins, but this immunity is not great and cannot usually be considered satisfactory. One

of the best examples of an apparent satisfactory immunity induced by bacterins is that reported by Smith and Little. We have little doubt that if the experiment which we are now reporting were repeated with another group of cattle, that the results would be different. Similar variations are apparent if one should compare all of the work which has been reported on this factor.

A careful study of these results fails to show that the living vaccine exerts any serious deleterious effects on the cattle. We

TABLE IV.

SUMMARY

	Group I Living vaccine	Group II Larson and bacterin	Group III Check
Number of animals	11	11	7
Number of sterile animals	1	1	0
Average age in years	3.5	3.7	3.0
Number of living calves	17	17	10
Percentage of healthy calves	63.6	50.0	61.5
Number of living calves with scours	3	4	2
Percentage of calves with scours	13.6	15.4	15.4
Number of pregnancies terminated by slaughter	4	0	2
Pregnancies per year	0.66	0.65	0.71
Services per pregnancy	2.6	2.4	1.6
Number of abortions following natural infection	1	2	1
Number of abortions following intravenous infection	4	4	1
Number of abortions following drenching	0	3	1
Percentage of abortions	22.7	34.6	23.0

have not experienced the difficulty of getting the animals in calf, as reported by Hart and Carpenter. The percentage of animals carrying the germs in the udder is as follows: Group I, 37%; group II, 44%; group III, 33%. This would not indicate that living vaccines greatly increased the number of animals eliminating the germ by way of their udders. A suggestive thing is found in the tenth line of table IV which shows that the num-

ber of services required per pregnancy was less in the check group than in either of the other two. We do not believe that, when all things are considered, vaccination with the living vaccine is a dangerous procedure in herds which are shown by the blood tests to be badly infected with *Bact. abortus*. The use of this product, however, should be confined to herds in which frequent abortions occur in the first and second pregnancies, which have been shown to be due to the Bang germ. The use of living vaccine will rarely, if ever, reduce the abortions below 10–15% and in some herds not even to this level. It may and probably does reduce the amount of infectious material by reducing the number of cases of placental disease. This fact has been pointed out by Smith and Little.

The results of this experiment, or the results of similar work heretofore reported, do not indicate that immunizing agents will solve all the difficulties or reduce the economic losses incident to infection with *Bact. abortus* Bang to a desirable minimum. We must therefore look for other means of control and other methods to diminish such losses. There is little data available to show the difficulties of procuring and maintaining a herd free of this infection. There is practically no experimental data to show what the breeding efficiency of such a herd would be, as compared to an infected one. M'Fadyean has shown that it is possible to keep herds free of this disease as shown by the blood tests. The conditions, however, under which cattle are kept in England, differ considerably from those in this country. Williams also has published some data on this subject, but it has been largely confined to individual animals, and herds have not been taken into consideration.

We believe that experimental data on the efficiency and economic advantage of herds free of this disease, based on the results of the blood tests, is urgently needed and our experimental work is now being devoted to obtain such information.

Conclusions

We believe that the following tentative conclusions are justified:

1. The living vaccine produces some immunity to invasion of the placenta by *Bact. abortus* Bang. The degree of immunity varies according to the individual and such variations are marked.
2. Bacterins have some immunizing value, but it is small.
3. Living vaccines apparently do not increase the number of

animals which eliminate *Bact. abortus* through the udder or discharges incident to parturition.

4. Abortions occur in animals which have been treated with vaccines.

5. Cattle have a marked variation in susceptibility to invasion by *Bact. abortus* Bang.

6. The incidence of white scours does not seem to be affected by the use of abortion vaccines or bacterins.

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We Have Room For A Thousand New Members This Year.

UNIVERSITY EXTENSION

(LETTER RECEIVED BY A WESTERN SCHOOL)

University of Minnesota,
Medical Department.

I would like to ask for some advice. I got a big cat, what is the best cat ever for taking rats, he has been fighting with them for a long time, and there is plenty of them to fight with, but he has gotten bitten quite often this last winter and those sores are so bad, that I'm afraid for him. Could it be possible that the cat could spread disease? Do you think I should have the cat killed, or are there something to heal the sores with.

I have tried to put iodine on but I hate to handle him. ("Tonics and Sedatives," in *Journal American Medical Association.*)

Why not send Professor Fitch to put the iodine on?

N.S.M.

TECHNIC AND COMPARATIVE STUDIES OF THE AGGLUTINATION AND COMPLEMENT-FIXATION TESTS FOR BOVINE INFECTIOUS ABORTION[1]

By FRED BOERNER, JR. *and* E. L. STUBBS, *Philadelphia, Pa.*

The material for this report has been taken from the records of routine tests done at the Laboratory of the Pennsylvania Bureau of Animal Industry, from June, 1920, to April, 1923. The technics for the agglutination and complement-fixation tests, in bovine infectious abortion, reported in this paper, were adopted by the senior writer, after careful study of the various phases of these tests. Reporting our studies of the comparative value of the two tests, we have considered it advisable to include a rather detailed description of the technics used, so the results may be more readily compared with the results of those using other methods.

TECHNIC OF AGGLUTINATION TEST

Suspected serum. Uniform tubes, five-eighths by five inches, which should be clean and sterile, are used. The suspected serum is measured into the tubes in the amounts of 0.1, 0.04, 0.02 and 0.01 cc which, on the addition of 2 cc of antigen, makes dilutions of 1 to 20; 1 to 50; 1 to 100; and 1 to 200, respectively. Higher dilutions are occasionally made when exact titer is desired.

Antigen. The antigen is prepared from four- to seven-day-old, glycerin-agar cultures of several strains *B. abortus* (Bang), which are washed off with and suspended in carbol-normal saline solution (1 part carbolic acid to 200 parts normal saline). This polyvalent suspension is diluted to compare with previous agglutinating antigen which has given satisfactory results and through which, in our test-tubes, five-eighths by five inches, ordinary book print is clearly read. The strains used for making antigen should be previously tested for agglutinating properties because of some variance in agglutinating properties of different strains. It is our custom to use several strains, making a polyvalent antigen. The antigen is added to each tube in the amount of 2 cc. The tubes are thoroughly shaken to insure the mixing of the serum and antigen, then placed in the incubator at 37½° C. for 24 hours.

[1]Contribution from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 15L. Received for publication, September 26, 1923.

Readings. At the end of 24 hours the tubes are removed and readings made. Results are recorded for each tube, a minus sign indicating negative, and +1, +2, +3, and +4 indicating 25%, 50%, 75%, and complete agglutination, respectively.

TECHNIC OF THE COMPLEMENT-FIXATION TEST

Suspected serum. The serum is tested in doses of 0.2 cc and 0.1 cc. Smaller amounts than these would be necessary in many instances if the exact titer is desired. The required amounts of serum are pipetted, with a few exceptions, directly from the original sample into the tubes used in the test. A duplicate tube of the 0.2 cc dose is included for each sample as a control to detect the presence of anticomplementary substances. After placing the required amount of serum in each tube, 1 cc of normal saline solution is added to each tube which is to receive antigen and 2 cc to the control tube which does not

[1]Contribution from the Bureau of Animal Industry, of the Pennsylvania Department of Agriculture. New Series No. 15L. Received for publication, September 26, 1923.

receive antigen. The tubes are then shaken and placed in a water bath at 58° to 60° C. for one-half hour, for the purpose of inactivating or destroying thermolabile complement and anticomplementary substances. This method of diluting the serum before inactivation has proved very satisfactory in our work. It has permitted the testing of serums which would partially or wholly coagulate when heated otherwise. Furthermore, the antibody content does not appear to suffer as much and the anticomplementary substances are as readily destroyed.

Sheep cells. The anti-sheep hemolytic system is used. Fresh defibrinated sheep blood is washed three times with an excess of sterile normal saline solution. A three per cent suspension of the cells is used. The speed and time of centrifuging should be the same for each lot of cells prepared, to insure as nearly as possible uniform corpuscle suspension for each test.

Complement. Fresh normal guinea pig serum is used. The animals are bled into sterile test tubes, which are kept at room temperature or incubator until completely clotted. The clot is then broken up, centrifuged and the serum pipetted off. The serum of at least three guinea pigs is pooled, even though the amount of serum obtained is far in excess of that needed for the test. This is done to overcome, in part at least, individual variation in amounts of hemolytic complement, thereby making it a more uniform factor in tests made from time to time. Complement is used in the amount of 1 cc of a 5 per cent solution in saline. We have preferred to adjust the hemolytic amboceptor to this fixed dose of complement rather than the complement to a fixed dose of hemolytic amboceptor.

Hemolytic amboceptor. Natural hemolytic amboceptor for the erythrocytes of sheep can be demonstrated in a large percentage of cattle sera but the quantity is not sufficient to influence the reaction to any serious degree. Hemolytic amboceptor is prepared by immunizing rabbits with intravenous injections of increasing doses of a fifty per cent suspension of washed sheep corpuscles. Rabbits showing a titer of 1-1000 or over are bled, the serum separated and preserved with 0.25 per cent carbolic acid. This is kept in the refrigerator as a stock solution, if subsequent titrations prove it satisfactory. The dose of hemolytic amboceptor employed is two units. The unit is determined by a method of titration in which the dose of amboceptor varies, while the complement and corpuscle suspension are used in fixed amounts. The method is as follows:

A preliminary dilution of 1-500 of hemolytic amboceptor is prepared. The amount to be made can be closely calculated from results of previous titrations of the hemolytic amboceptor used and number of sera to be tested. The dose varies from 0.5 cc to 0.1 cc, which gives a range from 1-1000 to 1-5000. These dilutions can be modified should the titer of the hemolysin fail to fall within this range. The amounts of complement and corpuscles are the same as used in the test, namely, a 5 per cent solution of the former and a 3 per cent suspension of the latter. Twelve tubes are usually used, three of which are controls. The amount of each ingredient, including salt solution, is given in

TABLE I—ADJUSTING HEMOLYTIC SYSTEM BY TITRATION OF AMBOCEPTOR

Tube	Hemolytic amboceptor (1-500)	Complement (1-20)	Corpuscles 3%	Salt Sol.	Result after 1 hour incubation
1	0.5 cc	1 cc	1 cc	2.5 cc	Complete hemolysis
2	0.45 "	"	"	2.6 "	" "
3	0.4 "	"	"	2.6 "	" "
4	0.35 "	"	"	2.7 "	" "
5	0.3 "	"	"	2.7 "	" "
6	0.25 "	"	"	2.8 "	" "
7	0.2 "	"	"	2.8 "	Partial hemolysis
8	0.15 "	"	"	2.9 "	Beginning hemolysis
9	0.1 "	"	"	2.9 "	No hemolysis
10	0	"	"	3.0 "	(Control) No hemolysis
11	0.1 "	0	"	3.0 "	" " "
12	0	0	"	4.0 "	" " "

In the above titration it is found that .25 cc of the 1-500 dilution (1-2000) of amboceptor is the unit. The dose to be used is two units which would be in this case 1-1000 and is obtained by diluting the 1-500 solution with an equal part of saline.

table 1. After one hour's incubation at 37½° C. the reading is made. The smallest amount capable of producing complete hemolysis is taken as the unit. Two units, or double the amount, are used in the test. The preliminary dilution of 1-500 is then diluted so each cubic centimeter will represent exactly two units, *e.g.*, should complete hemolysis occur in the tube containing 0.25 cc and not in the tube containing 0.2 the unit would be 0.25 cc and two units would be 0.5 cc. In this case the dilution for test is made by adding an equal quantity of salt solution to the preliminary dilution. Each cubic centimeter of the final dilution would then contain .5 cc of a 1-500 dilution, or two units of hemolytic amboceptor.

Antigen. The antigen is prepared from four- to seven-day-old glycerin-agar cultures of *B. abortus* (Bang), which are washed off with a small amount of sterile distilled water, care being taken to use no more than is necessary to remove the growth. It is our custom to use several strains, making a polyvalent antigen. The suspension is then heated at 100° C. for three hours and placed in the ice chest for ten days during which time it should be occasionally shaken. At the end of this period the suspension is well shaken and centrifuged, at low speed, for a short time or sufficient time to throw down a greater portion of the bacteria. The supernatant fluid, which should still have enough bacteria in suspension to make it quite turbid, is pipetted off and preserved by adding sufficient carbolic acid to make a .25 per cent dilution. In this form it is kept in the refrigerator as a stock antigen.

Antigens prepared by the above method have proved stable and very satisfactory. The presence of the bacteria themselves in the antigen adds to its quality. Bacteria-free antigens, although not so anticomplementary, are not nearly so antigenic and we have found some antigens prepared this way which have a peculiar property of failing to fix the complement when employed in large amounts but fixing it completely in smaller amounts. We are unable to demonstrate any lytic substances in these antigens. This phenomenon is one of interest which needs further study.

The amount of antigen to be employed depends on its anticomplementary and antigenic properties. No more than one-fourth the anticomplementary unit should be used and this should represent at least 4 to 5 antigenic units. A dose between these extremes can be employed, thus increasing the distance from both danger points. To do this it is necessary to multiply the anticomplementary unit by the antigenic unit and obtain the square root of the product, *e.g.*, the anticomplementary unit is 1-20 and the antigenic unit 1-600; 20 x 600 equals 12,000, the square root of which is 109+. 1-109 equals less than one-fifth the anticomplementary unit and is more than five times the antigenic unit.

The test. The actual test after titration of the various solutions may briefly be summarized as follows:

For each serum to be tested use three tubes arranged in a row in a wire rack. Into the first and last tube place 0.2 cc and 0.1 cc of suspected serum respectively. The middle tube is the serum control and receives 0.2 cc of the same serum.

TABLE II—ANTICOMPLEMENTARY TITRATION OF ANTIGENS

Tubes	Antigen 1 cc	Complement 1-20	Saline		Hemolytic Amboceptor	Corpuscles	
1	1-10	1 cc	1 cc	Incubate 1 hour at 37½°C.	(2 units) 1 cc	1 cc	Readings made after incubation for 1 hr. at 37½°C.
2	1-20	"	"		"	"	
3	1-40	"	"		"	"	
4	1-60	"	"		"	"	
5	1-80	"	"		"	"	
6	1-100	"	"		"	"	
7*	1-10	"	"		0	"	

*Control for presence of lytic substance in antigen.

TABLE III—ANTIGENIC TITRATION OF ANTIGEN

Tube	Positive Serum	Saline		Antigen 1 cc	Complement 1–20		Hemolytic Amboceptor 2 units	Corpuscles 3%		
1	0.2 cc	1 cc	Heated at 58°-60° C. for 30 minutes	1–25	1 cc	Incubated 1 hour at 37½° C.	1 cc	1 cc	Incubated 1 hour at 37½° C.	Readings made after partial settling of cells
2	"	"		1–50	"		"	"		
3	"	"		1–100	"		"	"		
4	"	"		1–150	"		"	"		
5	"	"		1–200	"		"	"		
6	"	"		1–300	"		"	"		
7	"	"		1–400	"		"	"		
8	"	"		1–500	"		"	"		
9	"	"		1–600	"		"	"		
10	"	"		1–800	"		"	"		
11	"	"		1–1000	"		"	"		
12*	"	"		0	"		"	"		

*Positive serum control.

After measuring the serum into the tubes, saline solution is added, 1 cc in the first and last tubes and 2 cc in the middle tube. The tubes are well shaken and placed in the water bath at 58° to 60° C. for one half hour. This inactivates the serum.

The antigen is next added, 1 cc being placed in the first and third tubes. No antigen is placed in the middle or serum control tube. One cc of 5 per cent complement is then added to each tube.

To make certain that the various solutions used in the test have been properly prepared, it is necessary to include in the test additional tubes which are known as control tubes. These are as follows:

(a) Antigen control. Place 1 cc of saline, 1 cc of antigen, 1 cc of complement in a tube and mark "A.C." on side of tube.

(b) Hemolytic control. Place 2 cc of saline, 1 cc of complement in tube and mark "H.C." on side of tube.

(c) Corpuscle control. Place 4 cc of saline in tube and mark "C.C." on side of tube.

(d) In each test two sera should be included as controls, one of which was positive and the other negative in previous tests. Use three tubes with the same dilutions of serum as used for the suspected sera. These can be identified in the test as "P. C." and "N. C."

All tubes are well shaken and placed in the incubator at 37½° C. for 1 hour. At the end of this time 1 cc of hemolytic amboceptor (2 units) is added to each tube except the corpuscle control, which is marked "C.C.", then 1 cc of a 3 per cent suspension of sheep cells is added to all tubes. The tubes are placed in the incubator at 37½°C. for 1 hour, at the end of which time the control tubes are examined and if the reactions are complete in these, *e.g.*, complete hemolysis in the three tubes marked "N. C." and those marked "A.C." and "H.C.," all tubes are removed and allowed to stand at room temperature for a sufficient time to allow partial settling of the sheep cells. The readings are then recorded.

The serum control tube should always show complete hemolysis at the end of the test, for otherwise the serum would be considered anticomplementary, hence unsatisfactory for the test.

Results of test are recorded after the following manner: A minus sign(—) indicates complete hemolysis; +1, 75% hemolysis; +2, 50% hemolysis; +3, 25% hemolysis; and +4, no hemolysis, but complete fixation.

TABLE IV—COMPLEMENT-FIXATION TEST IN BOVINE INFECTIOUS ABORTION

Serum cc	Saline Solution cc		Antigen cc	Complement (1-20) cc		Amboceptor (2 units) cc	Sheep cells (3%) cc		Results after allowing cells to partially settle
Suspected serum									
0.2	1		1	1		1	1		+4 (no hemolysis)
0.2	2		0	1		1	1		— (hemolysis)
0.1	1		1	1		1	1		+2 (partial hemolysis)
Positive serum									
0.2	1		1	1		1	1		+4 (no hemolysis)
0.2	0		0	1		1	1		— (hemolysis)
0.1	1		1	1		1	1		+4 (no hemolysis)
Negative serum									
0.2	1		1	1		1	1		— (hemolysis)
0.2	2		0	1		1	1		— (hemolysis)
0.1	1		1	1		1	1		— (hemolysis)
Controls									
Antigen	1		1	1		1	1		— (hemolysis)
Hemolytic	2		0	1		1	1		— (hemolysis)
Corpuscles	4		0	0		0	1		+4 (no hemolysis)

Heat at 58° to 60° C. for 30 minutes

Shake well and incubate for 1 hour at 37½° C.

Shake well and incubate for 1 hour at 37½°C.

COMPARATIVE STUDIES OF THE AGGLUTINATION AND COMPLEMENT-FIXATION TESTS

The results of the agglutination test are classified as follows:

Positive—Complete agglutination with a dilution of 1-50 or over.

Weakly positive—Partial agglutination with a dilution of 1-50.

Suspicious—Complete or partial agglutination with a dilution of 1-20.

Negative—No agglutination with a dilution of 1-20.

The results of the complement-fixation test are classified by the following method:

Positive—Complete fixation with 0.1 cc of serum.

Weakly positive—Complete fixation with 0.2 cc and partial or no fixation with 0.1 cc.

TABLE V—COMPARATIVE RESULTS OF THE AGGLUTINATION AND COMPLEMENT-FIXATION TESTS WITH SERA FROM 3948 CATTLE

		Complement-Fixation Test				
Agglutination	Reactions	Positive	Weakly Positive	Suspicious	Negative	Total
	Positive	850	5	49	9	913
	Weakly positive	119	12	16	15	162
	Suspicious	95	51	47	75	268
	Negative	25	11	36	2533	2605
	Total	1089	79	148	2632	3948

Suspicious—Partial fixation with either or both 0.2 and 0.1 cc of serum.

Negative—Complete hemolysis.

An analysis of table V reveals the following points of interest:

Agglutination Test

1. The reactions to the agglutination test show a higher percentage in the suspicious class than the complement-fixation. Of the 1343 which reacted, 268 (20%) were classified as suspicious.

2. Of the 913 sera giving positive reactions, 9 (0.9+%) were negative to the complement-fixation test.

3. Of the 162 sera giving weakly positive reactions, 15 (9.2%) were negative to the complement-fixation test.

4. Of the 268 sera giving suspicious reactions, 75 (28%) were negative to the complement-fixation test.

5. Of the 2605 negative cases, 2533 (97.4+%) were negative to the complement-fixation test.

Complement-Fixation Test

1. In over ninety-five per cent, reactions obtained by one test were confirmed by the other. That is, in only five per cent did reactions occur to one of the tests and not to the other.

2. The reactions obtained by the complement-fixation were more distinctly positive or negative compared with the agglutination test. Of the 1316 sera giving reactions to this test, 148, a little over 11 per cent, were classed as suspicious and, of these, only 21 (14%) were negative to the agglutination test.

3. A reaction to the complement-fixation test in which the tube containing 0.2 cc of serum showed less fixation than the tube containing 0.1 cc (commonly called paradox reactions) occasionally occurred in strongly positive sera. The cause of this phenomenon is not known. We cannot attribute it to the natural hemolysis as it occurs in sera in which this is absent. There is reason however to believe that it might be due to some colloidal reaction between the serum and antigen.

4. Of the 1089 sera giving positive reactions to the complement-fixation test, 25 (2.2%) were negative to the agglutination test.

5. Of the 79 giving weakly positive reactions, 11 (14+%) were negative to the agglutination test.

6. Of the 148 sera giving suspicious reactions, 36 (24%) were negative to the agglutination test.

7. Of the 2632 negative sera, 2533 (96.2+%) were negative to the agglutination test.

TABLE VI

Reactions	Agglutination Test	Complement-Fixation Test	Agglutination and Complement-Fixation Tests
Positive	913	1089	1164
Weakly positive	162	79	140
Suspicious	268	148	111
Negative	2605	2632	2533

COMBINATION TESTS

In table VI the results of each test and the combination of both are arranged for comparison.

The method of classifying the reactions obtained by the combination of both the agglutination and complement-fixation test is as follows:

Positive—Positive to one or both tests. Weakly positive to both tests.

Weakly Positive—Weakly positive to one test and suspicious or negative to the other. Suspicious to both tests.

Suspicious—Suspicious to one test and negative to the other.

Negative—Negative to both tests.

1. With the combination test, 1164 sera were classified as positive. This represents an increase of 75 (6.9%) over the number classified by the complement-fixation test alone and 251 (27.5%) over the agglutination test.

2. With the combination test, 141 sera were classified as weakly positive which is an increase of 61 (77.2%) over the number so classified by the complement-fixation test and a decrease of 22 (13.6%) under the agglutination test.

3. With the combination test, 111 sera were classified as suspicious which is a decrease of 37 (25%) under the number so classified by the complement-fixation test and a decrease of 157 (58.2%) under the agglutination test.

4. With the combination test, 2533 sera were classified as negative which is 99 (3.7%) less than the number so classified by the complement-fixation test and 72 (2.7%) less than the agglutination test.

CONCLUSIONS

1. The agglutination and the complement-fixation test for bovine infectious abortion have about the same value.

2. The reactions to the complement-fixation test are more decisive, leaving a smaller number in the suspicious class than the agglutination test.

3. A combination of the two tests is more accurate than either test alone.

4. A combination of the two tests detected from 2 to 4 per cent reactors which would have been classed as negative if either one of the tests had been used alone.

5. We urge those interested in this important problem to advocate, either through our national association or otherwise, a program of investigations for the purpose of formulating a standard method of conducting the agglutination and complement-fixation tests in bovine infectious abortion.

NEEDS A HORN

Prompt action by sanitary officials seems to have checked the spread of foot-and-mouth in California. Late reports indicate that it is now a matter of completing disinfection, tight quarantine, and active search for new cases. With no setbacks the infected areas will be "officially" clean in the course of a few weeks. It looks from this distance like a job well done.

"It appears to me," said Dr. D. F. Luckey, veterinarian at the St. Louis stock yards, in a recent address, "that the general public has a very limited conception of the immense value of the work that is being done every day of the year by the practicing veterinarians over this country, by way of controlling incipient outbreaks of diseases among animals and by reporting to the constituted authorities those outbreaks which they do not feel able to control themselves."

That is the case, and the reason is that the veterinary profession is too modest. The story of service performed in emergencies has never been told. Naturally, most people judge the value of veterinary service by ordinary, day-by-day practice, and that is neither very sensational nor, in the eyes of the layman, very important. Veterinary service in its larger aspects, in its guardianship of live stock health, is evident to very few. One hour's work on the part of one veterinarian may prevent large losses to hundreds or even thousands of farmers, in case of a highly contagious disease. The veterinary profession needs a horn and some wind to toot it!—(Editorial from *Chicago Daily Drovers' Journal*, March 18, 1924).

HEMORRHAGIC SEPTICEMIA STUDIES:

The Development of a Potent Immunizing Agent (Natural Aggressin) by the Use of Highly Virulent Strains of Hemorrhagic Septicemia Organisms.

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Hemorrhagic septicemia organisms, like most other disease-producing types, are subject to wide variations of virulence. It is not uncommon to find Pasteurella strains that are practically without infecting power even for the highly susceptible animal, the rabbit. Hoskins[1] reports the finding of avirulent and virulent strains of hemorrhagic septicemia organisms in the same animal tissues.

Hemorrhagic septicemia organisms pathogenic for large, domesticated animals have been described by Kitt,[2] Oreste and Armanni,[3] Poels,[4] Jensen,[5] Van Eecke,[6] Galtier,[7] Reischig,[8] Smith,[9] Mohler and Eichhorn,[10] and others. In this paper it is the intention to describe a strain of the hemorrhagic septicemia organism designated as culture "B" that exhibits all of the characteristics of the Pasteurella group and possesses a remarkably high virulence for all species of domesticated animals regardless of their age or condition. The culture was obtained from the hearts of several buffalo that died of acute disease in the Yellowstone National Park, in March 1922. The organism was recovered in pure culture which permitted a ready determination being made. This culture was soon observed to be unusual in the rapidity and regularity with which it destroys its host, the minuteness of the infecting dose and the extraordinary lesions it produces in the large domesticated animals. Furthermore, the culture has retained its full virulence up to the present time, which is somewhat over two years from the time of isolation.

This unusual virulence is not of academic interest only, but has a real practical significance. With this strain available for an "exposure virus," immunity experiments can be performed with little difficulty. Furthermore, as will be later shown, a highly potent immunizing agent against hemorrhagic septicemia disease can be prepared from the inflammatory edema it produces in abundance in large animals.

Received for publication, May 12, 1924.

The organism is short and plump. In the tissue fluids it approximates 1 micron in length and about .5 micron in thickness. It stains intensely at the poles and but slightly in the middle. It is non-motile, Gram-negative, grows well in infusion broth and produces a faint cloudiness. Comparatively little growth takes place in beef extract bouillon. No flocculation occurs in liquid media. Agar surface growths are delicate and almost transparent. Individual colonies are small and dewdrop-like. No growth occurs on ordinary acid potato slants. Gelatin is not liquified. Litmus milk is not changed save for an initial faintly acid reaction. No carbohydrates are fermented with gas production. Acid is formed in glucose, saccharose and galactose media. Nitrates are not reduced. Neither is indol formed in Dunham's peptone solution.

Table I gives the cultural characteristics of the virulent strain "B," together with those of several bovine strains. Repeated comparative tests were made, using a large number of hemorrhagic septicemia cultures in each test. The results were uniform in that no cultural or morphological differences could be detected between the virulent buffalo strain and the strains isolated from the tissues of domesticated animals.

TABLE I. CULTURAL CHARACTERISTICS OF CULTURE "B"

Culture	Motility	Broth clouded	Viscous sediment	Milk	Gelatin	Potato	Dextrose	Lactose	Saccharose	Maltose	Dextrin	Dulcit	Arabinose	Xylose	Raffinose	Mannite	Levulose	Inulin	Galactose	Indol	Nitrates reduced
Buffalo "B"	−	+	+	0a	−	−	A	−	A	−	−	−	−	−	−	−	−	−	A	−	−
Bovine No. 11	−	+	+	0a	−	−	A	−	A	−	−	−	−	−	−	−	−	−	A	−	−
Bovine No. 298	−	+	+	0a	−	−	A	−	A	−	−	−	−	−	−	−	−	−	A	−	−
Bovine No. 6834	−	+	+	0a	−	−	A	−	A	−	−	−	−	−	−	−	−	−	A	−	−

0a = No change except an initial slight acidity.

A = Acid production.

Note. In acid-production tests, Hiss' serum-water, extract broth, and extract broth fortified with normal bovine serum were used. Reaction—7.0 pH. Indicator—Andrade 1%.

Serological tests further establish the identity of culture "B" as a typical hemorrhagic septicemia organism. Twenty-four-hour bouillon cultures exhibit a high antigenic value when titrated by the complement-fixation test, using as positive serum a serum

hyperimmune to hemorrhagic septicemia organisms isolated from domestic animals.

Table II gives a typical antigen titration obtained with culture "B" which will be noted to compare favorably with the antigen titrations made with bovine strains.

TABLE II. COMPLEMENT FIXATION TESTS SHOWING TYPICAL ANTIGEN TITRATION

	.01	.02	.03	.05	0.1	0.2	0.4	0.6	0.8	2.0
	Antigen (Culture B) (*a*)									
Positive serum(*c*).....	x	xx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Negative serum(*d*).....	–	–	–	–	–	–	–	–	–	–
	Antigen (Culture 11)(*b*)									
Positive serum(*c*).....	–	x	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Negative serum(*d*).....	–	–	–	–	–	–	–	–	–	xx

a = 24-hour broth culture hemorrhagic septicemia organism (buffalo origin).
b = 24-hour broth culture hemorrhagic septicemia culture (cattle origin).
c = .2 cc inactivated horse serum hyperimmune to 9 strains of *P. boviseptica*.
d = .2 cc normal horse serum.
– = complete hemolysis.
x = 25 per cent inhibition of hemolysis.
xx = 50 per cent inhibition of hemolysis.
xxx = 75 per cent inhibition of hemolysis.
xxxx = 100 per cent inhibition of hemolysis.

Note. Hemolytic system employed consisted of a 3 per cent suspension of sheep erythrocytes, 2½ units of hemolytic amboceptor, and 1½ units of complement, the latter being titrated against the amboceptor and sheep cells.

Animal protection tests further show the relationship of the virulent buffalo strain to hemorrhagic septicemia organisms of cattle origin. Cattle injected with hemorrhagic septicemia organisms of bovine origin are rendered highly resistant to subsequent inoculations of living cultures of the virulent buffalo strains, whereas untreated control animals succumb in from 24 to 48 hours after receiving a like quantity of the virulent test culture.

In the performance of a series of immunity experiments and other investigations it was necessary to subject quite a few animals to the effects of this virulent culture of hemorrhagic septicemia organism. For the sake of clearness the list of exposures made will be set forth in chronological order. In this manner it will be readily observed that no appreciable diminution in the virulence of the organism has taken place during a period of something over two years. The last animal to which the culture

TABLE III. ANIMAL PROTECTION TESTS

Yearling bovine	Vaccinated with cattle strain	Exposed to virulent buffalo strain "B"	Results
1053	5-9-22 (W-14)	5-24-22 (1 cc 24-hr. bouillon culture subcutaneously)	Lived
1016	Control		D. 5-26-22. Acute H.S.
1025	5-24-22 (298)	7-11-22 (1 cc 24-hr. bouillon culture subcutaneously)	Lived
1028			Lived
1039	Controls		D. 7-13-22. H.S.
1067			D. 7-13-22. H.S.
1101	8-25-23 (Mixture of 9 bovine strains)	9-12-23 (5 cc 24-hr. bouillon culture subcutaneously)	Lived
1102			Lived
1104			D. 9-14-23. H.S.
1105			Lived
1107			Lived
1108			Lived
1111	Controls		D. 9-13-23. H.S.
1114			D. 9-14-23. H.S.

D. = Died. H.S. = Hemorrhagic septicemia.

was given succumbed within 18 hours. This animal was injected April 22, 1924, at 3 p. m., and was found dead the following morning at 9 o'clock.

TABLE IV. RESULT OF EXPOSURES TO CULTURE B.

Animal	Age	Dose of Virus	Method of Exposure	Exposure	Results
Bull 983	1½ yrs.	2 cc suspension lung tissue original buffalo	Subcut.	4-6-22	D. 4-8-22
Heifer 1030	1 yr.	5 cc bouill. cult. heart blood original buffalo			D. 4-7-22
Cow 889	12 yrs.	.01 cc bouill. cult.		4-19-22	D. 4-20-22
Sheep 634	Aged				D. 4-20-22
Hog 3441	12 mos.	1 cc bouill. cult.			D. 4-20-22
Hog 3442	10 mos.	Small piece of lung of cow 889	Allowed to be eaten	4-21-22	D. 4-24-22

TABLE IV. (CONTINUED)

Animal	Age	Dose of Virus	Method of Exposure	Exposure	Results
Mule 248	Over 15 yrs.	5 cc bouill. cult.	Subcut.	5-1-22	D. 5-2-22
Hog 3395	10 mos.				D. 5-2-22
Heifer 1054	2 yrs.			5-24-22	D. 5-26-22
Bull 1016	2 yrs.				D. 5-25-22
Heifer 1049	3 mos.	5 cc bouill. cult. grown 48 hrs. at 42.5° C		6-13-22	D. 6-14-22
Bull 1039	7 mos.	.3 cc bouill. cult.		7-11-22	D. 7-13-22
Heifer 1066	2 yrs.	.5 cc bouill. cult. grown 72 hrs., at 42.5° C			D. 7-13-22
Heifer 1067	2 yrs.	1.0 cc bouill. cult.			D. 7-13-22
Bull 1011	2 yrs.	3 cc bouill. cult.		11- 8-22	D. 11-10-22
Shoat 3463	7 mos.	Piece of spleen of bull No. 1011	Allowed to be eaten	11-10-22	D. 11-13-22
Bull 1068	7 mos.	.01 cc bouill. cult.	Subcut.	11-15-22	D. 11-17-22
Heifer 1044	11 mos.	15 cc bouill. cult.	Orally		Remained well
Bull 1073	13 mos.	1 cc bouill. cult.	Subcut.	8-21-23	D. 8-23-23
Bull 1099	2 yrs.			8-23-23	D. 8-25-23
Heifer 1111	2 yrs.	5 cc bouill. cult.		9-12-23	D. 9-13-23
Bull 1114	2 yrs.				D. 9-14-23
Heifer 1057	2 yrs.	3 cc bouill. cult.			D. 9-24-23
Heifer 1070	2 yrs.	100 cc bouill. cult.	Orally	9-22-23	D. 9-27-23
Heifer 1147	2 yrs.	2 cc bouill. cult.	Subcut.	12-18-23	D. 12-20-23
Bull 1131	9 mos.	1 cc bouill. cult.		12-19-23	D. 12-21-23
Bull 1133	7 mos.	.01 cc bouill. cult.		1-23-24	D. 1-25-24
Heifer 1130	1 yr.			1-30-24	D. 2-1-24
Horse 190	15 yrs.	5 cc bouill. cult.		2-11-24	D. 2-12-24
Mule 253	20 yrs.			3-19-24	D. 3-21-24
Heifer 1172	12 mos.	.01 cc bouill. cult.		4-22-24	D. 4-23-24

In addition to the animals mentioned in table IV, one normal cow and one scrubby yearling were inoculated with comparatively large amounts of culture "B." Neither of these two animals reacted in so far as to show a rise of body temperature. For some unknown reason they possessed an absolute immunity to the disease.

The regularity with which the bouillon cultures of this hemorrhagic septicemia organism killed large domesticated animals, without regard to their species, age or condition, suggested the possibility of the organism producing in broth culture a powerful exotoxin. This, however, was found not to be the case. Bouillon cultures rendered germ-free by passage through bacteria-retaining filter candles were without appreciable toxicity either for large animals or small laboratory animals.

Cultures were made from the heart blood and spleen of each of the animals that succumbed to the effects of the buffalo culture. Pure cultures of the original organism were obtained in each instance.

The antemortem symptoms observed in the affected animals were more or less alike. Within several hours after inoculation the body temperature began to rise rapidly, usually reaching 107°F., or higher. Respirations and pulse rates also advanced. Inappetance and general depression were noted quite early. A swelling occurred at the site of inoculation which was usually made in the side of the neck. This swelling grew rapidly in all directions reaching the maximum in extent at the eighteenth to twenty-fourth hour after injection. Much heat and tenderness in the swelling were noted. Muscular tremors usually preceded the death of the animal, which frequently occurred suddenly.

The autopsy findings were quite uniform, especially in those animals that received the virus subcutaneously. In these animals the most striking lesion produced was the enormous subcutaneous and intramuscular edema. The straw-colored, inflammatory exudate was most plentiful about the site of inoculation and the brisket, where the swelling commonly reached a thickness of four or more inches. Extensive edematous swellings were usually found extending from the submaxillary space to the xyphoid cartilage of the sternum. To a less extent subcutaneous and intramuscular edemas were found throughout the entire body. The less dense connective tissues in the space between the subscapularis muscle and the chest wall were invariably filled with inflammatory exudate.

But slightly less in prominence than the extensive edema were the myriads of hemorrhages and enormous engorgement of the smaller blood vessels and capillaries. These circulatory lesions produced an effect similar to a thorough splashing with blood, the droplets of which would occasionally coalesce to form small pools. Although hemorrhage and congestion were the rule throughout the entire animal body, the heart, pericardium, lungs and pleura were the most severely affected, these tissues being literally studded with hemorrhages of all sizes. The body lymph glands were swollen, deeply congested and hemorrhagic. The muscle tissues were pale and edematous. The lungs were edematous with numerous hemorrhages visible beneath the pleural covering. The thoracic cavity frequently contained much liquid. The spleen was seldom enlarged but frequently presented large hemorrhages beneath the capsule. The peritoneal coverings of the digestive organs presented occasional patches of hemorrhages. Petechia on the surface of the kidneys were seldom seen.

In those animals that died as a result of feeding tests, the autopsy revealed very little edema and the petechial hemorrhages were less numerous. The lungs appeared to be the most severely affected, showing pneumonic areas similar to those found in "swine plague" and "stock yard pneumonia."

The histopathological changes in the various tissues were confined to edema, congestion and hemorrhage.

The observation that this virulent hemorrhagic septicemia organism would persistently produce a copious amount of inflammatory edema, which was heavily laden with the causative organism, suggested the possible use of the exudate as an immunizing agent should it be found to contain substances akin to the aggressins described by Bail and Weil,[11] Citron and Putz,[12] and Wasserman and Citron.[13]

Experiments conducted with rabbits showed that the injection of small quantities of the inflammatory exudate, rendered germ-free by filtration, would enhance the virulence of weakly pathogenic hemorrhagic septicemia organisms and cause these animals to succumb. These observations seemed to demonstrate the presence in the inflammatory exudate of what appeared to be an aggressin, and immunity studies were therefore undertaken to determine whether cattle could be effectively immunized against hemorrhagic septicemia disease by the subcutaneous injection of the germ-free, inflammatory exudate. Tables V and VI show that amounts of 5 cc of the aggressin, injected subcutaneously in

to susceptible yearling cattle, produced in these animals a high grade immunity to hemorrhagic septicemia infection. The animals so treated were able to withstand with no inconvenience subsequent injections of a test amount of virulent organisms that contained at least 500 lethal doses. This severe exposure was given for two reasons; first, to determine whether a solid immunity was established in the aggressin-treated animals; second, to compare the results of immunization with hemorrhagic septicemia bacterin, hemorrhagic septicemia vaccine and hemorrhagic septicemia aggressin.

Close observations were made on these animals after they received the exposure to virulent hemorrhagic septicemia organisms. Those animals that were treated with bacterin suffered the most from the exposure. They experienced an appreciable rise in body temperature, refused feed for several days and one animal died in about forty-eight hours. The vaccine-treated animals suffered to a less extent. They showed some rise in body temperature, refused feed for one day, but all the animals in this class lived. The aggressin treated cattle were not affected in any manner by the test exposure.

TABLE V. IMMUNITY EXPERIMENTS

Yearling No.	Immunized	Exposure	Results
1100	5 cc Aggressin 8-25-23	5 cc Virulent Culture "B" 9-11-23	Lived
1103			Lived
1106			Lived
1104	5 cc Bacterin 8-25-23		D. 9-14-23
1105			Lived
1108			Lived
1101	5 cc Vaccine 8-25-23		Lived
1102			Lived
1107			Lived
1111	Controls		D. 9-14-23
1114			D. 9-14-23

SUMMARY

A hemorrhagic septicemia organism of high virulence is described. The culture was obtained from buffalo tissues and is

TABLE VI. AGGRESSIN IMMUNITY EXPERIMENTS

Yearling	Immunization	Exposure	Date	Result
1142	5.0 cc Aggressin 12-4-23	5.0 cc 24-hour bouillon culture "B"	12-18-23	Lived
1144				Lived
1147	Control			D. 12-20-23
1143	5.0 cc Aggressin 12-4-23		12-19-23	Lived
1145				Lived
1131	Control			D. 12-21-23

Note. In all the control animals typical lesions were observed and the hemorrhagic septicemia organism recovered from heart blood in pure culture.

highly pathogenic for all species of domesticated animals. The virulence of the organism remains unchanged up to the time of this writing, a period of over two years.

The culture is indifferentiable from hemorrhagic septicemia strains obtained from the tissues of domesticated animals by either cultural, serological or animal protection tests.

The organism produces rapid death with extensive lesions, in animals exposed by subcutaneous inoculation. Feeding infection was effected in both swine and cattle.

The inflammatory exudate produced by this culture exhibits the properties of an aggressin and can be successfully used as an immunizing agent against hemorrhagic septicemia disease.

Immunity experiments conducted on a limited scale with yearling cattle showed that aggressin-treated animals were solidly protected against severe exposure to virulent cultures of hemorrhagic septicemia organisms, whereas yearlings treated with vaccine and bacterin were not so fully protected against the same exposure.

Relatively large quantities of exudate can be obtained from the animals infected with this organism, permitting practical use being made of the natural aggressin thus obtained.

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ANOTHER OUTBREAK OF HEMORRHAGIC SEPTICEMIA IN LAMBS

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The outbreak in question is of interest, because it adds more evidence to that already recorded relative to ovine hemorrhagic septicemia. Since there is yet much to be learned about this disease, it seems worth while to report our observations even though they revealed nothing particularly new. These observations support the theory that this infectious disease is not transferred from sick to healthy animals of the same species.

The lambs comprised a shipment of 9,500 head, loaded at White Sulphur Springs, Montana, and consigned to Messrs. Gillies and Hubbard, at Evansville, Wis. These lambs weighed about 60 pounds each, and were shipped in double-decked cars having a capacity of approximately 300 head each, arriving at their destination on September 25, 1923.

It was necessary to unload the lambs at Marmarth, North Dakota, and at Montevideo, Minnesota, while en route. About one pound of hay per head was fed at each of these feeding stations. The lambs were in transit four days.

The shippers sold most of these lambs to farmers around Evansville and Janesville, Wisconsin, but Mr. Hubbard kept about 2000 head for himself. When he unloaded these at Evansville, about 30 were dead or in a dying state, and others were visibly sick. Conveyances were used to transport the sick lambs to the farm, as it was realized that they should not be driven. The next morning, after having been in the feed lots over night, 30 more were found dead, and quite a number very sick. Two of the latter were taken to the Veterinary Science laboratory at the University to have the disease diagnosed, and to obtain information relative to methods of control.

One of the lambs was examined in detail. This one was moribund and unable to rise. The respirations were jerky and numbered 54 per minute. The pulse was arhythmic and so weak it could not be counted. The temperature was 103° F. A profuse, catarrhal, nasal discharge was noted, also some injection of the conjunctiva. The owner said that although

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the lambs appeared dull and stupid, they often ate until close to the last; but that was not strange as they were very hungry, having been fed but twice during the long journey from the West.

A careful post-mortem examination revealed pneumonia, confined to a small area of one lung. The only other lesions of note were small hemorrhages beneath the covering and lining serous membranes (epicardium and endocardium) of the heart.

Microscopic examination of the blood failed to reveal bacteria. However, the history of the disease, together with the symptoms shown and the lesions found, justified a tentative diagnosis of hemorrhagic septicemia. Accordingly, the owners were advised to have their veterinarian administer hemorrhagic septicemia bacterin (ovine) to half of the lambs, and to leave the rest untreated as controls. The writer frankly stated that this product might not confer protection, but it was the only therapeutic agent available. The reason for suggesting that part of the animals be treated was to get a line upon the efficacy of the bacterin. They decided to follow this advice, but were unable to have the work done that day.

The next morning they found the lambs so much better that they decided to "watch and wait." The lambs continued to improve, and no new cases developed. Consequently, nothing else was done in the way of treatment.

Two weeks later the owners reported that the lambs in all the feed lots were doing well and showing no signs of ill health. Much to their surprise, many of the sick one recovered. One farmer reported that he had taken a dozen or more sick lambs in a truck, in the evening, to a shed where he could give them special care. One of these lambs was so sick that he did not unload it, as he expected that it would die before morning; but during the night the lamb jumped out of the truck, and the next morning was found near by eating grass and apparently well.

The following excerpts from a letter written by Mr. Gillies, under date of October 15, 1923, are of interest:

"One feeder who bought 300 of these lambs said he noticed 75 sick; but all of these recovered except eight. Another feeder who had 450 head did not lose any. One man who bought 500 head lost only three. My son-in-law had 260 and lost only one. Still another man had 650 and lost fourteen. Mr. Horne lost 21 out of 1260. Mr. W. J. Jones of Janesville had the biggest loss in proportion—38 out of 600 lambs having died; but his were on the cars an extra day, and most of these lambs were dead before they arrived at their final destination."

Altogether, out of 9,500 lambs shipped, about 275 died, almost all of them within twenty-four hours of the time they were unloaded.

Only a few of the feeders gave any sort of treatment. Certain ones, however, called Dr. R. E. Schuster, a veterinarian of Evansville, who prescribed medicine that was administered in milk as a drench.

This outbreak of hemorrhagic septicemia in a shipment of western lambs is comparable with those reported by Hoskins[1] and Newsom,[2] in that deaths occurred quite suddenly after symptoms were evident and the disease ended as suddenly as it started. There was a much larger percentage of recoveries, however, in this outbreak than was reported in the other outbreaks. The point of practical interest is that in all these outbreaks the disease was self-limiting and not directly contagious as the term is generally used. This fact tends to discredit the practice of administering bacterin as a preventive.

After considering all possible source of infection, the two most likely are: (1) the cars in which the lambs were loaded for shipment; (2) the yards, feed, and water at the feeding points en route. In view of the fact that no lambs were observed to be sick when unloaded at either feeding point, it appears unlikely that the infection was contracted from inadequately disinfected cars, although this possibility exists, as the incubation period of hemorrhagic septicemia may be as long as ten days.

On the other hand, there is a decided probability that the infection was picked up at one of the feeding stations. These places are constantly receiving sheep from many widely separated ranches and consequently are likely to become infective, especially if precautions are not taken at frequent intervals to clean and disinfect the entire premises, with the possible exception of the open pens to which sunlight and air have ready access. Moreover, food and water are easily contaminated with infective discharges from diseased animals, and thus become means by which the infection is spread.

The predisposing causes in this outbreak were evidently the long railroad journey and the changes in climate, food and water, incident to shipping, all of which rendered the lambs susceptible to infection. While the direct cause was not positively identified, it is reasonable to conclude that it was the

Pasteurella oviseptica, the bipolar-staining organism now recognized as being responsible for hemorrhagic septicemia in sheep.

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Does Your Wife Know About The Women's Auxiliary?

SOUTH CAROLINA GUARDS AGAINST ABORTION

Dr. W. K. Lewis, State Veterinarian of South Carolina, has favored us with a copy of the regulation which became effective June 1, 1924, governing the importation of cattle and swine, for breeding purposes, into the State of South Carolina, and designed to restrict the movement of abortion-infected breeding stock into that state.

Paragraph 1. All cattle and swine, six months of age and over, before entering the State of South Carolina, if for purposes other than immediate slaughter, same shall pass a negative blood test for infectious abortion, (agglutination or complement-fixation), made by a Federal, State or commercial laboratory. Tests will not be accepted if made on female cattle or swine in less than 15 days following abortion or normal parturition, or more than three weeks prior to movement into the State of South Carolina.

Paragraph 2. Each animal shall be ear tagged, or otherwise permanently marked for identification, and the health certificate must show the date of the test and name of laboratory making same. If test is made by a commercial laboratory, the original report must be approved by the proper live stock sanitary official of the state of origin and attached to the copy of the health certificate sent to the State Veterinarian of South Carolina by the veterinarian who issues the health certificate. Health certificates must be issued in duplicate, the original to be forwarded to State Veterinarian, Columbia, South Carolina, and the duplicate attached to the transportation company's waybill and accompany the shipment to destination.

Paragraph 3. No person, firm, corporation, or transportation company shall move or transport, in any manner, cattle or swine into the State of South Carolina except in accordance with the requirements contained in paragraphs 1 and 2.

Paragraph 4. Cattle moving in violation of requirements contained in paragraphs 1 and 2 will be quarantined and tested at the owner's expense, and any reactors found will be tagged or branded for identification and quarantined upon the owner's premises.

Paragraph 5. Violations of this regulation will be prosecuted for a misdemeanor.

Have You Secured One New Member This Year?

TREATMENT AND PROPHYLAXIS FOR PARASITIC DISEASES OF LIVE STOCK[1]

By MAURICE C. HALL

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While I have been sitting here I have been trying to think of some way of presenting this topic which would avoid a too evident repetition of what I have previously said elsewhere on this subject, and, with that in view, I have been mentally following an animal from birth. A recapitulation of these thoughts may be of interest to you.

If you start with a young animal in the maternal uterus, you have an animal which is protected to a large extent from injury —it is in an environment of practically uniform temperature, with a rather uniform supply of nourishment from the maternal blood, and it is water-jacketed, so to speak, as a protection from shock and traumatic injury, and safe, on the whole, from infection.

At the time of birth, this young animal is thrown out on the cold, hard world, into a very different environment. From that uniformity of temperature it changes to an environment with a temperature ranging from the bitter cold of the winter night to the extreme heat of the summer noon. Leaving that uniform nourishment, it begins to feed on all sorts of things, and its food supply may lack essential elements or contain substances actually poisonous. Finally, it leaves that environment of comparative safety from violence and disease and is surrounded, to a greater or less extent, by the forces which produce injury and disease. Now, we have begun to appreciate, in the last few years, that there are more factors in disease production than we had previously realized. It is not sufficient that there should be present certain primary factors of disease, an etiological agent and an animal of susceptible species, but there are a number of factors predisposing to disease or contributing to the incidence of disease which must be present if disease is to result from the association of these primary factors.

Now one of the essentials is an individual susceptibility, and the animal lacking this individual susceptibility has, on the other hand, an immunity. I am not competent to generalize exten-

[1]A talk delivered at the meeting of the Pennsylvania Veterinary Medical Association at Wilkes-Barre on September 26, 1923.

sively on immunity, but certain broad principles must cover a great many cases at least. In a general way we may say that immunity is natural and acquired. The young animal at birth has its natural immunity, but it has very little acquired immunity. Much of the acquired immunity has an age factor in it. Animals as they become older become immune to many things. The young animal is more susceptible to parasitic diseases, more susceptible to infestation and to the pathological results of infestation, than is the older animal. We know that we can not infect old animals with many species of worms, but young animals are commonly susceptible to these parasites. In the case of the young animal, it is necessary that we substitute for this acquired immunity, which will be acquired only in later life. prophylaxis. We may therefore think of prophylaxis in youth as our substitute to some extent for the acquired immunity of maturity.

Natural and Acquired Immunity

Here is a young animal which is susceptible, we will agree, to certain diseases. It has a certain natural immunity, but it will not have an acquired immunity until it is an older animal. We must therefore give these live stock infants something of the same sort of care that we give our babies. We know that some animals are born in a very immature condition, and it is quite a while before they can fend for themselves. Keep in mind that our live stock animals are not living under natural conditions. They are being confined to comparatively small quarters, where any existing infection or infestation becomes greatly concentrated. We must give them protection. If we are to do that, we shall have to reverse many of our present habits, and especially the mental attitude which the farmer, live stock owner and many veterinarians take towards the deaths of these young animals. We are too indifferent in regard to this matter.

There is always a reason why these animals die. The farmer says, "Oh, well, it was a little runt, anyhow. It never would have amounted to anything. What is the difference? There is nothing lost." In some cases this is true, but in many cases it is not true. If you give the young live stock protection against the disease organisms which surround them, a much higher proportion will survive than do survive at present. Even now some of the tougher and more resistant animals survive in spite of bad surroundings by virtue of natural immunity; but very good animals,

potentially profitable, are puny merely because they are suffering from the attacks of disease organisms against which they might have been protected.

How are you going to protect them? I shall speak along the lines of sanitation. It is easy to say "sanitation," but sanitation is a big word. It covers the whole subject of conditions which make for health—control of food, of enemies large and small, and of many other things which make up an animal's environment. You can not always go to the farmer, of course, with a set program, but, in many case, we can give specific measures. In the course of time, as your young animals grow up, if you follow no prophylactic measures, some will survive, and others will die off. Others will become diseased. You will have animals which are affected by disease organisms but which are not clinical cases, and some that are clinical cases. Your clinical cases you will treat. Cases which are not clinical cases—what are you going to do with those? You might have stomach-worm disease of sheep cropping up every third or fourth year; if you can eradicate worms from the flock, from animals not clinical cases, as well as from those that are clinical cases, you can avoid this loss every third or fourth year. If you treat only your clinical cases of disease, you often perpetuate your struggle against it. We change our judgments from year to year as to the importance, necessity or desirability of doing these things.

McLean County System

I am going to talk very briefly on the specific questions which have been given me. The subject of sheep and swine parasites will be of interest to some of you. In the case of swine, the worm which has attracted the most attention, of course, is the ascarid. As a result of investigation, largely those of Ransom and his collaborators in the Bureau of Animal Industry, the subject of prophylaxis for that disease has received considerable attention, and has resulted in many valuable suggestions which have been made to the farmers and veterinarians of this country. In the McLean County system of swine sanitation, you carry out the following program:

You scrub out the farrowing house thoroughly with boiling water, soap and lye. We have laid the emphasis on *thoroughness* in cleaning up rather than on *chemicals*. However, some of the coal-tar products are worth using for their added effect on worm eggs, provided no attempt is made to substitute chemical dis-

infection for thorough cleaning. Then you scrub the sow to get rid of the dirt on the skin, especially the udders; clean up the sow and put her in the clean farrowing pen. Remove her from the pen within ten days after farrowing, and put her in a field sown to forage crops and not used by pigs since it was planted. Provide plenty of pure drinking water and shade. The results have been worth the effort.

The interesting thing about it is this, that we have here an actual use of sanitation in farm practice, a very unusual thing. We have always urged sanitation on general principles, but it has not been adopted on general principles. As a preventive measure for disease in general we have not secured its adoption, but as a preventive measure for worms we have got people to adopt it. If hogs are raised in a dirty hog lot, they are usually fed improperly, and coupled with this improper feeding and its bad effects, we have any number of infestations and disease conditions. If you put these swine out on a forage crop, and insist that they get green feed, insist on clean water and wide range, you dodge a lot of dietary errors and deficiencies and bacterial troubles. We carried this sanitation system to the farmer as a prevention for worms, and sold it on that basis, but it is preventing all sorts of bacterial diseases and dietary deficiencies, as might have been surmised, and was surmised. It is working beautifully.

Oil of Chenopodium Indicated

Now, if we use this system, should we treat swine for worms? I think so. If you get rid of the worms in swine by suitable treatment, you cut down on an important source of trouble, and that is the production of worm eggs in the case of ascarids. It does not appear to me, therefore, that treatment should be abandoned solely on the basis of good results from the swine sanitation system. The two things are supplementary, and each has its place. The treatment that we have recommended on the basis of critical experiments is the use of oil of chenopodium, usually combined with ample doses of castor oil. The veterinarians of this country have been using the chenopodium treatment very extensively, with the result that many of them have come out with new methods of using it, including the use of the stomach-tube. This method of administering chenopodium appears to be reasonably rapid, as well as safe, and Dr. E. R. Steel tells me that he can dose eighty pigs an hour by this method, which is fast enough.

Another really serious problem in the way of worms is that of the lung worm. I think our preventive measures along the line of swine sanitation system will probably be useful in the prevention of lung-worm infestation. I would say that prevention is of major importance here. I do not know any satisfactory treatment for lung worms. I am skeptical of treatment for these worms by drugs administered by mouth or by inhalation or intratracheal injection. In a case where a herd is infected, I think the infected animals should be isolated, kept in clean, safe areas, and properly fed. Nursing treatment appears to be the safe and conservative line of treatment at present.

In the case of sheep, it is extremely difficult to dodge infection with worms. It is a very serious problem to get away from the stomach worm. Dependence has come to be placed on treatment. In South Africa the treatment is a rigorous one, which for certain reasons does not appear at present to be adapted to conditions in this country.

Epsom Salts as an Adjuvant

In the treatment of dogs for hookworms, we have been trying some experiments recently in the simultaneous administration of carbon tetrachlorid with Epsom salts. The idea in using Epsom salts is this: Macht, at Johns Hopkins, took some aspirin for headache, which did not do any good. He failed to get the customary relief after a second dose, and, in seeking an explanation for this, he remembered that he had taken some salts a half-hour before the first dose. It occurred to him that the well-known salt action, producing a flow of fluid from the wall of the digestive tract to the lumen, might inhibit an absorption current in the opposite direction. He and Finesilver tested out this idea on a string of dogs, using various drugs with salts, and found that the drugs in the presence of Epsom salts did not produce the usualy physiological action. A test of the renal function with phenolphthalein showed that this drug was not excreted and therefore was not absorbed. On the strength of this work, we tried out the carbon tetrachlorid treatment with Epsom salts simultaneously administered, and it proved very satisfactory. It removed all the hookworms precisely as the carbon tetrachlorid alone would remove them. On theoretical grounds this method of administration should increase the safety of the treatment, and Lambert's experience in treating hookworm infestations in man, in Fiji, supports this theo-

retical presumption of increased safety. In small animal practice, I would say that, in my opinion, carbon tetrachlorid should be given to dogs with Epsom salts simultaneously administered. The solution of salts is best given by stomach-tube, as dogs have a tendency to vomit if they taste the salts. Passing the stomach-tube in dogs is not a difficult matter.

In conclusion, let me reiterate this: That we must regard young animals as special cases, distinct from older animals and requiring special consideration; that older animals have both natural and acquired immunity, whereas young animals have only natural immunity; and that we must supply the protection afforded by prophylactic measures in the form of sanitation, in the broad sense of that word, to the young animal as our substitute for the acquired immunity which will only be obtained later in life. Sanitation for our live stock babies will mean a reduction in infant mortality among live stock comparable to that which has been obtained by similar measures among human infants.

Plan To Go To Des Moines, August 19-22.

HEALTHY CALVES FROM TUBERCULOUS PARENTS

Success in rearing healthy calves from tuberculous parents is reported in Alaska Stations Bulletin No. 5, Eradication of Tuberculosis in Cattle, at the Kodiac Experiment Station, recently issued by the Department of Agriculture.

This work, which has been going on for five years, was originally undertaken in an effort to save the valuable herd of crossbred Galloway-Holstein-Friesian cattle which had been developed at the station and which had become infected with tuberculosis from unknown sources.

Thirty calves of different breeds, dropped in the tuberculous herd from 1917 to 1920, inclusive, were taken from their dams 24 hours after birth, kept in separate quarters, and fed pasteurized milk of the tuberculous cows. None of them developed tuberculosis, and all were eventually added to the sound herd.

The bulletin discusses the development of the herd at the station and the subsequent advent of the disease, as well as the methods of raising the calves to prevent them from contracting and spreading the disease. A copy may be secured, as long as the supply lasts, from the United States Department of Agriculture, Washington, D. C.

THE NON-DESCENDENT TESTICLE IN SMALL ANIMALS[1]

By FRANK H. MILLER, *New York, N. Y.*

My pleasure in being one of those invited to appear at this Conference was possibly only exceeded by the difficulty I had in finding something suitable to offer upon an occasion of this kind, where it is pretty universally understood that only practical things of work-a-day importance are to be taken up for discussion.

In selecting as my subject the non-descendent testicle of smaller animals, I should, perhaps more properly, have confined my title to that of the dog, since practically all of my personal experience in this condition has been had in treating that animal. I claim for this condition much more clinical importance than has hitherto attached to it, if we may judge from the great dearth of information upon the subject to be found in veterinary textbooks and current literature of this profession.

What little I have been able to glean from those sources convinces me that beyond calling attention to an anomalous condition, mainly of anatomical interest, veterinary observers, as distinguished from those in human medicine, possibly according to its proper bearing upon the question of reproduction, almost without exception have attached little or no importance to its potentiality for malignant and non-malignant changes.

There was a time when, with less experience, I too paid but little attention to the ectopic testicle in canine practice, provided it was unilateral and the other organ appeared normal, but broader experience has long since brought the conviction that in dogs, at least, the condition, at its best, always presents for us a rather hazy borderline between faulty conformation and actual disease, often quite impossible to define accurately at the moment of examination, a condition which should at all times have our careful consideration, especially when dogs are being examined for purchase.

The knowledge we already have, imperfect as it undoubtedly is, as to the part played by the enzymes in maintaining the general vital equation, goes far to make us understand, as at

[1]Read before the University of Pennsylvania Conference of Veterinarians, Philadelphia, Pa., January 8-9, 1924.

one time we could not understand, the great and variable, physical, temperamental and nutritional changes, brought about by cryptorchidy in men and animals, and should, I think, even if no other reason prevailed, keep us from knowingly passing even the monorchid dog as a sound animal.

No animal or man is even approximately sound, whose normal, functioning testes are absent from the scrotum.

The non-descendent testicle, undoubtedly prevailing to a greater extent in the smaller breeds of dogs, where the hair frequently obscures the scrotal and inguinal area, beyond much question does figure to some extent in the too common practice of veterinarians, either overlooking or seeing the abnormality, in considering its inconspicuous presence of too common and trivial nature to disturb a pending sale.

Many here will, I am sure, agree with me when I state that from every point of view an otherwise desirable dog with an irascible, erotic, nervous temperament, given to satyriasis and very possibly onanism and other almost equally objectionable habits (and cryptorchidy has a decided bearing upon all these conditions), while it may not, as in the case of the horse, be positively dangerous, he is nevertheless an animal with very undesirable predispositions, not the least of which I firmly believe to be a well-defined tendency to develop neoplasms, some of them benignant, many of which are, however, decidedly malignant.

In point of fact, tumors of malignant types in ectopic testes in dogs represent such a large percentage of all diseases of the testes, normal or ectopic, in my practice, as to cause me without hesitation to state that the hidden organ does to a very marked degree predispose to malignancy, but, as in similar conditions in man, we cannot as yet do more than theorize as to why this should be the case.

Whether these changes in the aberrant organ take place as a result of abnormal, irritative pressure exerted by surrounding tissues, or whether as a result of disturbed spermatogenesis, we of the veterinary profession are as profoundly ignorant as our brother of human medicine. Up to the present time, we have nothing tangible as to the cause of this tendency to new growth, and it appears quite proper here to state that exact knowledge of the actual cause of non-descent of the testes in man and animal equally eludes us. Whether it be due to defective structure or function of the gubernaculum testis, to inability, due to

size, of the organ to be engaged in the internal abdominal ring, or perchance due to an abnormally short spermatic cord, to faulty frenum and infundibuliform fascia, or abnormally small internal canal, none can state, with any degree of certainty. There are, however, features connected with this condition in dogs which seem to me to differ quite materially from that in man and possibly other animals.

Personal experience leads me to the conclusion that true intra-abdominal cryptorchidy is comparatively rare in the dog. The great majority of the wandering organs become static after having passed out through both rings forming the so-called preputial type of ectopia, the clear minority being found stationary, just inside the outer abdominal ring.

The condition varies very greatly from that of the human, in that very fortunately it seldom indeed appears to be accompanied by the hydrocele or hernia which so constantly attends the condition in man.

Some surgeons of great experience claim these complicating conditions to be present in practically one hundred per cent of their cases observed in the human subject. Without conclusive evidence, I am much inclined to the belief that non-descent of the testicle in the dog is, to quite an extent, due to inelasticity of the frenum testis and possibly more or less the same condition of the infundibuliform fascia.

My reasons for this belief, briefly stated, are based upon the fact that in removing the hidden organ I commonly find that after the testicle is fully exposed by the incision, it does not come down to any extent without considerable traction being used, traction which if investigated by the index finger through the pelvis, as may easily be done in small dogs, will be found to be exerted mainly against the abdominal wall in the region of the internal ring and not, as might be expected, extending up along the spermatic cord into the abdominal cavity as theoretically would be the case if the non-descent had come as a result of shortening or changes in the gubernaculum, mesorchium, or spermatic cord.

It is foreign to the purpose of this paper, however, for me to attempt to establish the cause of this peculiarity of development, since in comparative as in human medicine and surgery, there seems to have been but little headway made in its genesis during the past century. My chief desire at this time is to draw your attention to the fact that in these cases we are confronted

with a condition and not a theory, and since this is a conference, state my procedure in the situation and in return be advised of yours.

Since plastic surgery in the way of bringing about the satisfactory establishment of the ectopic organ within a more or less artificial scrotum, as is at times accomplished in the human subject, seems impracticable and particularly since such restoration in man has not by any means entirely removed the danger of malignancy following upon such an organ, I think we are justified at all times in doing the radical operation.

Whether or not it be possible that somewhat incestuous breeding for a type, a thing not unknown among dog owners, and particularly in breeding down the size in toy dogs, has any extensive bearing upon its prevalence among dogs, I know not, but I have no hesitancy whatsoever in stating the belief that, taking all breeds of dogs at all ages beyond six months (I think it desirable to make ample allowance for tardy development), the prevalence of ectopic testicles in dogs will exceed the condition in man by four hundred per cent, and possibly more. It may be of interest to know that in the examination of recruits in the world war the ratio of cryptorchidy in its various forms was approximately two persons in one thousand.

Upon the other hand, my experience leads me to believe that while the tendency for these organs to develop disease is quite as great in the dog as in man, there is a much greater number of non-malignant tumors in dogs in proportion to those in man and those of the malignant type seem in the main to lack the great virulence of those in men, although I have encountered cases where the malignancy was extremely great.

If we were altogether to ignore the undoubted tendency of such organs to take on malignant and non-malignant conditions, the prospect and probability of correcting such undesirable tendencies as I have already mentioned, and many more that do at times present themselves in such animals, should, I think, warrant us in resorting to early operation in these cases.

The indisputable tendency to grave trouble in such cases should cause us at all times to be somewhat insistent upon early operation as being in favor of all concerned, especially since the operation is so simple and practically devoid of danger to the animal.

In examining such animals for purchase, I refuse to certify

them as sound, and give both parties my reasons therefor. If the condition be bilateral, I account the animal as having the standing of the eunuch. If unilateral, and no change can be detected in either organ, I suggest that the owner have the proper correction made at his expense and risk, provided the purchaser is willing to accept the animal upon those conditions.

This I have invariably found a safe and satisfactory procedure in my practice and one I am now commending to you with the request for your constructive criticism.

Does Your Wife Know About The Women's Auxiliary?

COLORADO VETERINARIANS PLAN UNUSUAL MEETING

The summer meeting of the Colorado Veterinary Medical Association will be held in Colorado Springs, August 7-8, coincidentally with the 1924 Colorado Endurance Ride. The morning of the first day will be taken up with business, and the afternoon will be given over to a literary program. In the evening the veterinarians will meet at the Antlers Hotel for a dinner, after which they will listen to Major Leonard, of the Remount; Colonel Harris and Colonel Neil, both of the Army; Mr. D. Bryant Turner, of Broadmoor, on the Arabian horse; and last, but not least, Mr. Wayne Dinsmore, Secretary of the Horse Association of America.

The literary program will be resumed on the morning of the 8th. Those who will address the meeting have been selected from the different branches of the live stock industry served by veterinarians. The speakers have been asked to tell the veterinarians of their faults and shortcomings, as they see them. Representatives of the banking and legal professions will round out the program.

Secretary Fisk states that the object of this rather unusual program is to widen the veterinarian's scope of vision and to strengthen his grasp on the general agricultural and economic situation. The program will be concluded at about 11:30 on the second day, and a basket lunch will be served at the noon stop of the Endurance Ride, where an opportunity will be afforded the veterinarians to look over the horses that have completed 270 of the 300 miles of the race and are about to start on the last lap of 30 miles. Entertainment will be provided for the ladies.

THE MILK AND MEAT INSPECTION SYSTEM OF READING[1]

By E. E. Romberger, *Reading, Pa.*

Reading (Pa.) has a population of about 110,000. The Division of Milk and Meat Inspection is a department of the Bureau of Health. At present the force consists of a Chief Milk and Meat Inspector, an assistant, a lay meat inspector, chemist and assistant chemist. An additional dairy inspector will be appointed in 1924. The Division is not a food control unit, but confines its inspection to milk, ice cream, meat and meat food products.

Reading utilizes a license control system to raise revenue for the functions of the Division. Every milk, meat, cured meat and ice cream dealer is required to take out a license. The fees are: pasteurizing plants, $20.00; other milk dealers, including retailers, $10.00; meat dealers, $10.00; ice cream manufacturers, $10.00; cured meat dealers, $1.00. Farmers selling their own meats in and about the streets of the city are granted a free license. By this means approximately $11,000 is raised yearly, making the office practically self-sustaining.

Milk Inspection

In 1921 Reading adopted a milk ordinance patterned after State and Federal model ordinances. This being essentially a pasteurization ordinance, it of course aroused the usual amount of opposition at first, and it was even necessary to make one or two minor concessions to the opponents of pasteurization.

This ordinance specifies four grades of milk: certified, Grade-A-pasteurized, Grade-B-pasteurized, and Grade-A-raw. Grade-B-pasteurized milk does not now exist, and probably never will.

The daily milk consumption is about 50,000 quarts, of which approximately 95% is pasteurized. There is but one Grade-A-raw dealer selling about the streets, handling about 300 quarts daily. There are two raw dealers delivering milk to large dealers to be bottled and sold as a special milk, called nursery milk. There are two certified dairies. All milk sold in the city is bottled, with the exception of the 300 quarts of Grade-A-raw, which is sold in sterilized, spigot cans. This milk runs a surprisingly low bacterial count, sometimes approaching certified counts. The wagon with the can and dipper is unknown in

[1]Presented at the University of Pennsylvania Conference for Veterinarians, January 8-9, 1924.

Reading. In restaurants and cafes the small, half-pint, individual bottles must be used when a glass of milk is requested by a patron.

From these figures it will be seen that included in our supervision are but five raw dairies, all with accredited herds and modern equipment, and 20 pasteurizing plants, 25 establishments in all. This is a comparatively low number, and permits of close contact with each one.

In the past we have been making sporadic farm inspections. Several hundred samples of farmers' raw milk are analyzed each year. A number of violations of the law have been found. No systematic farm inspection of the 600 farms has been attempted, which is the only course which will be effective. In 1924 we were authorized to employ a new man, whose sole duty it will be to work among the farmers in our very backward county, not only to try to teach better milking habits, but to try to improve equipment, barns and herds, and incidentally to speak a word for tuberculin testing, which seems to have a bad reputation with some of the farmers, who think it is some sort of a scheme to separate them from their cattle.

Reading does not require milk from tuberculin-tested herds for pasteurizing. If that were to be made a ruling today, over three-quarters of the people of Reading would be drinking canned milk tomorrow, or else be without milk.

The farmers are compelled to sign an application requesting a permit to produce milk for use in the city, and agreeing to meet our inspection requirements. They will be scored semi-annually on the standard score cards. No standard-type dairy-barn is insisted upon, nor will be insisted upon, so long as the farmer is clean in his present barn. A dirty farmer can be very, very dirty in a standard-type dairy-barn.

From four to six samples of certified milk are taken monthly for analysis, two to three of nursery milk, the same as Grade-A-raw, and from five to seven samples of pasteurized milk. These are taken at irregular intervals during the month. The tests are averaged up, and then the results are printed in the newspapers, showing the fat average, sediment, and bacteria counts for each dealer. This seems to be having an excellent moral effect not only on the dealers but on the public.

Bottles and Plant Analyses

This office has considerable faith in bacteria counts, notwithstanding the recent efforts to discredit them. We have

experienced that the counts are very sensitive to a change in plant conditions, and that when properly taken they usually indicate pretty closely the quality of the milk and the way it is handled. They certainly indicate the keeping qualities of the milk. We frequently take the milk from all twenty pasteurizers and allow all the samples to turn sour naturally, noting the keeping qualities, time of souring, kind of souring, type of bacteria predominating, etc., and we usually find that the samples which originally showed the lowest counts stand up best.

Routine inspections, of course, are made of the plants. The milk for analysis is practically all collected off the city routes early in the morning.

What is Included

We are endeavoring to follow out the regulations of the State Advisory Board with reference to pasteurization at 145°F., but must admit that we are encountering difficulties.

We require health certificates every six months. These examinations can be made by the family physician. This method has certain limitations which we will correct eventually.

We know that our inspection service has shortcomings, but we know what they are and will correct them. But we also believe that the city's milk supply is above the average. For one thing, we know the supply is safe. We can go home and sleep at night without fear of a milk-borne epidemic next day. Furthermore, the supply is adequate, and of a fair price.

Recently a Government dairy expert from Washington commended our inspection, at another meeting, saying that Reading is one of the few cities he visits where he can sit down in a cafe, or restaurant, ask for a glass of milk, receive a little individual bottle of it, and feel sure that he is getting a good, pure, cold article. We have had the same report from other sources.

The people are beginning to drink more milk. The last Reading Fair was almost a revelation to me. To see men, women and children lined up several deep in front of stands dispensing nothing but milk was a far cry from the old days of pop, beer and other digestion disturbers. These people would not have bought milk if they didn't like it and didn't have confidence in it.

This office does what it can, by means of newspaper articles and other publicity, to stimulate interest in the use of milk, particularly among children, and to make the people understand what a valuable article of food milk is in the diet. Incidentally,

since the inauguration of the pasteurization law, Reading's baby-death-rate has been cut in half, although a considerable amount of credit must also go to the visiting nurses for this. Physicians tell me that summer complaint in babies has dropped off considerably, and attribute the improvement to better milk.

Ice Cream

Reading's ice cream ordinance is a recent affair, and only within the past year has any attempt been made to enforce it. We believe this is now one of the few cities in the country which makes any attempt at systematic ice cream inspection.

We take on an average of two to four samples per month from each of the fourteen dealers. Inspections of the plants are also conducted. We have devised a score card for the plants and for the ice cream also. The results of the analyses for fat and bacteria are published in the newspapers.

Meat

On April 1, 1922, a new and comprehensive meat ordinance became effective in Reading. It gave the Division almost unlimited authority in the means to be used to better the city's supply. The writer was placed in charge of its enforcement.

This was essentially an inspection ordinance, although it provided for licensing, salaries, penalties, and all other details. At the time little thought was entertained that Reading would be able to inspect and stamp all of its meat because it was considered that this would require too large a force.

However, after a careful canvas of Reading and the outlying districts adjacent to Reading, it was discovered that the city was confronted with a peculiarly fortunate condition of affairs which could be used to good advantage.

It was found that in the city there was one large establishment under federal inspection, two fairly large abattoirs slaughtering nearly every day, and a number of small butchers, commonly known as "cow" or "bologna" butchers, all within a short distance of each other and usually slaughtering only two or three times each week. It was figured that with a little assistance from the Chief Inspector, one man could handle all the inspection in Reading, because of the close proximity of the slaughter houses, by compelling the butchers to save all the primal parts of each animal until the carcass was inspected and passed or condemned.

In the country districts it was found that while a large amount of meat was brought to the city by country butchers, about

75% or 80% of such meat came from one section. It was figured that one man could inspect all this meat on four weekly trips over this route, embracing two full days and two half-days. The remainder of the time of this man could be utilized in traveling in other sections. It was also figured that the inspector stationed in the abattoirs in Reading would usually be available for a few hours during the week for similar work.

This proposition was placed before council, a lay inspector was appointed, transportation furnished, and the process of inspecting and stamping all the city's meat was started.

The matter had been given such publicity that most of the dealers knew what was being contemplated, so that a campaign of education was not necessary. Most of the dealers were surprisingly willing to cooperate.

The dealers were instructed to leave hanging, until the inspector arrived, all carcasses, with heads, lungs, liver and mesentery intact and all glands present, and kept so that the inspector would know from which carcass each set had been taken. Regular routes were established at regular times, and most of the dealers accommodated the time of their slaughtering to the time of our visits.

How The Work Was Started

The inspection was started at a rather slack period, in early summer. Of course obstacles had to be overcome at first, but the inspection soon settled down to a routine matter. The lay inspector, a very competent man, did practically the same work as the veterinarians, except that he was instructed to retain suspicious carcasses for final inspection by a veterinarian.

In late fall and winter the winter butchers started. These are the "snow" butchers, or farmers who slaughter their own hogs and bring them to market. These were scattered over a wider range than we were accustomed to, and while a large number were taken in on the regular routes of inspection, there were still quite a number that could not be reached. These were made to bring along to the market the lungs, liver and head or head glands of the swine. Our inspectors went through the markets when they opened in the morning, and inspected the meats in the market houses.

At first, through fear of the inspection, a number of pork butchers discontinued, and some threatened to stop raising hogs. After they found the inspection was nothing fearful or unreason-

able, they took heart, and this winter most of the old faces are back again.

A few butchers peddled their meats on the streets of the city. This was the weak point of our inspection. These butchers were told either to come to City Hall to have their meats inspected, or else to call the Meat Inspector on their arrival in the city, so that a man could meet them on the route. Some did this, but unquestionably some did not, and we had no effective way of checking up on those who did not. Even now we have difficulty with this problem, and it probably will continue to present difficulties until this insanitary way of selling is prohibited by law.

This is a brief summary of our system of meat inspection. The details of course I do not have time to consider here. The results can be told in a few words.

Condemnations Increased Rapidly

Our condemnations increased remarkably, which was to be expected. But the most impressive result was that the inspection drove poor meat out of Reading. The town now gets better meat than ever before in its history, as any butcher will tell you, and we believe no city in the country has a better basic supply of meat than this city, when the entire supply is considered.

Our inspection is aimed at the source of the meat supply. We devote comparatively little time to the retail butcher shops, except to those which we have learned from experience need attention. We have learned that the butchers have found it to their interest, if they wish to retain their trade, to have their shops clean and their meats fresh. People are becoming more intolerant of insanitary conditions, and they buy accordingly. So our force was directed at the abattoirs and the country slaughter houses to see that only healthy and clean meat was produced.

We all know that steers and young heifers and bulls, and even old bulls, run comparatively low in condemnations. The problem of diseased meat is confined almost entirely to cows, and in our section, in which only a few herds have been tuberculin tested, it is a real problem. Now we agree that there must be a market for local cows; that they must be sold somewhere. We still have a market, and we are handling our share. But whether the sale and preparation of cow meat should be left to the tender judgment of each butcher who is in that business admits of little question. The men found in this game are rather typical to

start with, and their judgment as to whether a carcass is fit to be used is not always sound and may be prejudiced. So we prefer to pay particular attention to such inspection. Unfortunately for the dealers, it does not seem possible, in this section at any rate, for a dealer to remain in this business, earn a decent living, and still remain honest.

So, after a few months of rigid inspection, the field of cow butchers narrowed down until it included only the larger abattoirs, where the inspector is always present at the killing. This simplified our work considerably, as we had anticipated. There are now only three firms slaughtering beef in Reading. One is under federal inspection. The other two found, after six months of city inspection, they they could do just as well with federal inspection, have applied for it, and probably within six months all the slaughtering done in Reading will be done under government inspection. This simplifies our work still more. These large abattoirs furnish a sufficient outlet for the cows in this section. Among the country butchers not more than two or three deal in cows, although at first there were quite a number. These now in existence slaughter only one or two a week, all of which are closely inspected.

Figures Prove Statements

Statistics, of course, substantiate the above. In 1921, 21,000 carcasses of cattle, swine, calves and sheep were inspected, and 75,000 lbs. of meat condemned. In 1922, 44,000 carcasses were inspected, and condemnations were 131,000 pounds. In 1923, 52,000 carcasses were inspected and 156,000 pounds of meat condemned, about twice the figures for 1921. These condemnations include not only entire carcasses, but meat products, fish, and primal parts, such as lungs, livers, tongues, heads, etc. Of course the large abattoirs sustained by far the greatest part of these condemnations, particularly within the past year.

Years ago I would not eat bologna made in this or any other town. I now eat our bologna with no qualms of conscience. The price of meat did *not* go up. It did not go up even in the beginning. The price is now normal compared with other cities. And competition is fairer among the dealers.

Any other city can accomplish the same inspection. But its officials in charge must first have the wisdom and foresight to make a stand for such protection of public health as was shown in our city by Wm. J. Smith, Superintendent of Public Safety, and Ira J. Hain, Health Officer.

Any city would be wise at least to start such a system, for this reason: The more work done in this line, the easier it becomes. It is surprising how many little details work themselves out to advantage that had not been figured on in the first place. It may teach, for instance, some surprising things about the honesty of certain of your dealers.

It educates both your dealers and the public, and arouses their interest, particularly after the ladies get over their first indignation at having their carcasses all covered with blue ink. More cities must eventually adopt some such protection, simply as a matter of self-defense; for when bad meats are driven out of one town they will just go on to the next town, which will then have double its share of the stuff.

We do not claim that our inspection is infallible. We admit that sometimes an unscrupulous dealer will get something by us. But such occurrences are now rare, and the small amount to be gained by bootlegging meat is not worth the chance of detection and fine. The moral effect of such inspection is possibly of as much value as the actual inspecting itself.

We Have Room For A Thousand New Members This Year.

IDAHO VETERINARY MEDICAL ASSOCIATION

Secretary J. D. Adams announces that the Idaho Veterinary Medical Association will meet at Lewiston, Idaho, July 14-15, 1924. It is the purpose of the Association to have alternate annual meetings in Northern Idaho.

A cordial invitation is extended to the veterinarians of other states and associations, and all veterinarians who may be touring the country and happen along at that time. Lewiston is the metropolis of that part of Idaho, located at the junction of the Snake and Clearwater Rivers, which gives the city a very picturesque setting in a very beautiful valley with scenic highways leading out to the surrounding country.

The great scenic North and South Idaho highway, penetrating the Idaho forests and the famous Salmon River Canyon, passes through the city of Lewiston, connecting the main highway leading from Spokane to Portland via Walla Walla and Pendleton, down the Columbia River highway.

Plan To Go To Des Moines, August 19-22.

MEAT INSPECTION IN A LARGE CITY[1]

By EDWARD E. BEHRENS, *Philadelphia, Pa.*

Supervising Meat and Cattle Inspector, Bureau of Health

The public in general does not realize to a full extent the duties of a meat inspector. It is a general opinion that all the meat inspector does is examine the meat in the meat shop. Little does the public know that the meat inspector must be versed in sanitary measures, as the sanitary police work is one of great importance in the meat inspector's routine.

The real function of meat inspection begins while the animal is on foot, in the yards or pens. Here the veterinary inspector makes a physical examination to determine whether or not the animal is suffering from any disease. This step is most important and is taken as a preventive measure. If, upon examination, the animal is found to be in anyway abnormal or suffering from any ailment it is segregated and is kept in quarantine until it recovers its normal condition. In some cases the animal is destroyed and sent to the denaturing plant.

After the antemortem or physical examination is completed the animal is taken to the killing-beds, slaughtered and a most rigid postmortem examination is conducted. If the animal proves to be healthy, the meat is passed and so marked.

Not all meats sold in the City of Philadelphia bear the official stamp of the U. S. Bureau of Animal Industry, Pennsylvania Bureau of Animal Industry or the Bureau of Health, Philadelphia. Considerable meat is brought into Philadelphia from adjoining counties and states by farmers who have dressed the animals on the farm. No inspectors were present when these animals were slaughtered and therefore the meat bears no stamp.

Again, we find that some unscrupulous dealers go through the country and buy up questionable animals. If one should be taken sick or is sick at the time of sale, these dealers move the animal to some secluded spot, stop and slaughter it. Other dealers will kill animals that they know could not pass inspection in the same manner and then smuggle the meat into the city and endeavor to make a quick sale.

One particular case was just recently discovered where a man was bringing a truckload of live hogs to Philadelphia. On the

[1]Presented at the University of Pennsylvania Conference for Veterinarians, January 8-9, 1924.

journey the driver noted one of the hogs lying on the floor of the truck dead. He stopped, cut the hog's throat and when he arrived in Philadelphia offered it for sale. A representative of the Meat Division was watching close by and when the business transaction was completed, seized the hog, condemned it, sent it to the denaturing plant and legal action was instituted.

Another case just recently discovered was one where a dealer sent seven tuberculous carcasses of beef to the city. No stamps were visible to the inspector and upon examination it was discovered that each animal had well developed lesions of tuberculosis which had been trimmed out to deceive the inspector if, perchance, he should find them.

Many more cases could be cited but I mention these to show reasons why the housewife should be most careful in buying her meats and insist that the meats purchased shall come from carcasses bearing the official stamps of inspectors showing that the meats have been inspected and passed.

Proper Handling of Meat Essential

Meats may leave the abattoir in a wholesome condition and still reach the consumer in such a condition as to be unfit for human consumption. In a very short time good meat may be reduced to a state of inedibility by careless and insanitary handling, transportation in dirty vehicles, not being properly protected in transportation, exposure to dust and insects, contact with badly kept ice-boxes and meat-block, and in numerous other ways.

The housewife upon whose shoulders rests the responsibility of the family marketing could be of great assistance to the inspector if she would not only restrict her dealings to shops in which a high sanitary standard is maintained, but also insist upon most scrupulous cleanliness in handling. Always be ready to commend the shopkeeper who keeps a clean, sanitary store and handles his food articles in a sanitary way and be just as free to voice your dissatisfaction with the dealer who disregards all the laws of sanitation.

The records of condemnations show that a considerable percentage of all condemnations can be traced to lack of care in handling and transportation. This is particularly true in the cases of fish condemnations.

While an inspection was being carried on recently it was discovered that one of our dealers had 107 sheep stored in his ice-

box which were unfit for food. These sheep spoiled because the dealer had not carefully cooled out the carcasses before putting them in the boxes. Inspectors meet many cases of improper cooling in poultry, where the shipper will pack fowl before the animal heat has left the meat and thereby smother it.

Educational Phase Must Not Be Neglected

The meat inspector of today must not neglect the educational work, as our experience has proved that by keeping educational work in the foreground better results can be attained and much time saved. It is far too true that we cannot educate all with whom we come in contact and especially the dealer who is in business for gain only. We must try and prove to the business man that if he does not put anything in business he gets nothing out of it.

We must show the storekeeper the principles of cleanliness and prove to him that light and cleanliness constitute one of the cheapest advertisements. In our educational campaign we find that a large number of our merchants fall in a group who are willing to comply with the rules and regulations of the Bureau of Health, but, on account of ignorance, they are continually a health menace.

We meet another group in which we find those who care only for gain and do not care for any law at all. I might give an illustration of a case where a notice was served upon a certain storekeeper to clean his establishment and place it in a sanitary condition. When a reinspection was made, the notice served was pasted in a very conspicuous place in the window. Customers unable to read English, who frequented the store, would ask what was the meaning of the paper in the window and at once the shopkeeper informed the customers, "That is a certificate from the Board of Health that the store is clean and I sell the best goods in the neighborhood." Casting the eye about the store would contradict this statement. I mention this case to show how unscrupulous dealers will take advantage of an ignorant customer.

It is this type of storekeeper who thinks that the inspector is trying to deprive him of his livelihood. After the inspector has tried to explain sanitation he receives a reply something like this, "This is not a drug store. You take the crust of bread from my family. I'm a poor man trying to make a living." It is cases such as these that make the task of the inspector most difficult.

We meet others who will give an excuse that they are too busy

to clean their places of business. This is especially true in the chicken slaughtering establishments. This class of people believe that as long as there is a customer in the store it is an excuse for dirt.

Chicken Slaughtering Establishments

At the present time 114 chicken slaughtering establishments are established in Philadelphia. It is this branch of the inspection which gives the Bureau the most trouble. Where you have a large number of chickens penned up in close quarters and cleaning is neglected, most offensive odors emanate. Two inspectors are devoting their entire time to maintaining these plants in a sanitary condition. These inspectors not only correct insanitary conditions in these plants but are also on the alert for diseased poultry, either live or dressed, and when found it is at once destroyed.

Meats for Hospitals Inspected

One of the most important duties of our city meat inspection service is a most rigid inspection of all meats sent to the Philadelphia General Hospital for Contagious Diseases, Philadelphia Hospital for Mental Diseases, the Home of the Indigent and the House of Correction. At one time it was our attitude to look upon these places as institutions, but now our Department of Health regards them as hospitals.

Inspectors are at the above named when deliveries of meats, poultry, fish and shell-fish are made and all articles must be up to the specifications and in a wholesome condition. In some cases we have found it necessary not only to reject the food articles as not being up to specifications, but also to condemn them and send them to the tank as being unfit for food. It was at one time the belief on the part of certain contractors that any kind of meat was good enough for the city institutions, but that idea has completely vanished. It can safely be said that the meats, poultry, fish and shell-fish served in these hospitals are as good as those consumed in the average homes of private families and in some cases the quality is far superior.

When the Division launched this line of work many obstacles confronted us and at times our institutions were placed in embarrassing circumstances, as our supply of meats was very low, but nevertheless our standard was in no way lowered and the various contractors began to see that we meant business and now

are working in conjunction with the inspectors instead of against them.

Prosecuting Violators

Much care and pains must be taken in drawing up cases for prosecution. These prosecutions are instituted for conducting business without licenses, selling unwholesome meat, poultry, fish, game and shell-fish, and maintaining insanitary stores. In cases of conducting a business without a license or insanitary stores, a notice should first be served by the inspector, in which he should point out the violation and state how he wants the violation corrected. Not only should a written notice be served but the inspector should be careful to explain fully to the violator just what needs to be done and how to do it. A great many of these violations are due to ignorance and upon reinspection one will find that the defect has been corrected. Only persistent cases should be forwarded for legal action.

All cases of persons bitten by dogs, drawn to the attention of the Department of Health, are investigated and the animal suspected is held under observation and quarantined to determine whether the animal is rabid.

While it is true that the inspection service of today is at a high standard and a strict surveillance of the meat trade is being kept, still it is a fact that the solution of the slaughtering problems and exclusion of diseased meats will not be obtained until municipal abattoirs and receiving stations for country-dressed meats are established.

It can be safely said that 98% of the meats which reach the consumer in Philadelphia has been inspected, either by the federal or city authorities. I am of the opinion that the only means of controlling meat inspection is by means of the erection of municipal abattoirs and receiving stations, for the following reasons.

Animals may be unfit for human food on account of a number of reasons, namely, physical condition of the animal, health of animal, postmortem changes, infection of meat by persons, places, or conditions of storage.

Antemortem Examination Necessary

The physical condition of the animal can be only very imperfectly (to say the least) appraised after its slaughter and dressing. Therefore, the antemortem examination by qualified veterinarians is necessary. Death from age, disease or accident is certainly undesirable. An animal in a dying condition, due to injury,

overwork, fright or drugs, cannot be said to produce a satisfactory food. To eat cuts from an immature animal is something not to be relished.

However well known may be the fact that the direct transmission of disease to man by eating infected meat is largely negative, yet man rightly hesitates to eat that which is manifestly abnormal. In this country the custom is to cook meat very thoroughly and this usually serves to kill most any infection which may be present. But neither drying, condimental preservation, nor smoking destroys parasitic infestations which may be in meats. In muscular tissue localized infected areas are not so common as in organs. These areas may be hidden away in folds and difficult to see, but infection of the lymph gland is sufficient ground for condemning the organ, for the reason that the organs cannot be dissected to such an extent that all infected areas may be demonstrated. That diseased and hence more or less abnormal meat may cause nutritional or other physiological disturbances has not been demonstrated one way or the other, but safety lies in refusing such products.

In view of the above facts, as to the relatively greater degree of pathological changes of the organs in comparison with the muscle meat, it is apparent that effective meat inspection can be obtained only when the inspector can examine the viscera. It is impossible for him to do this before slaughter and neither can it be done after the carcass is dressed and freed from its viscera. Accordingly it is necessary, in the interest of public health, for the inspector to be present at the time of slaughter and supervise all phases of the dressing.

Must Deal with All Sorts of People

It has been common observation that unless coercive measures are at hand there is a tendency for some to follow the line of least resistance and be only as sanitary as they have to. Some pride themselves in maintaining attractive establishments, some must be watched continually and others are of a general average cleanliness. There is the monetary value of a carcass which may be diseased and therefore should be tanked. There is a tendency to trim up these carcasses and make them as presentable as possible. Skillful operators are adept at this practice. An inspector may go through a plant and find every thing in a good working conditions but as soon as his back is turned conditions may reverse to the extreme.

Only by being in constant attendance at the time of slaughter and dressing can an official be certain that the food is prepared under sanitary conditions, to which he attests by stamping the carcass as healthy. By maintaining this control the consumer is assured that the meat which is purchased was originally healthy, was slaughtered and stored under sanitary conditions.

Right Kind of Publicity

As long as loose practices may happen and do often happen in meat plants, the consumer will find them out and resent them. This unpleasant publicity keeps the public unsettled and restricts consumption.

The meat industry has recently awakened to the fact that it must take energetic measures to combat the decreasing per capita consumption of meat. It must not only check this decline but must increase the consumption in order to absorb the products of the packing plants which were so greatly expanded during the war. Some of these plants are idle while others are operating at limited capacity. Fixed charges must be carried by the volume of business done. The overhead is high. The problem is to reduce this cost. The latter interests the public. Concentration in a municipal abattoir solves the problem. Consumption can be increased by increasing public confidence.

Tendency Toward Standardization

Present tendencies in commerce are toward standardization and uniformity of methods. With uniform standards and universal inspection the meat-packing industry will be stimulated and will thrive.

From the above mentioned facts the consumer is entitled to demand protection from the dealer who buys cattle and takes the chance of it being free from disease. On the other hand the conscientious dealer would be protected from imposition from unscrupulous or ignorant shippers by the Department of Health, which body could give proper certificates of condemnations and save him the payment of full price for diseased live stock and inedible meat food products.

During the past year 65,726 pounds of meats, 38,950 pounds of poultry and 11,271 pounds of fish have been rejected. A black list has been established of certain dealers and their bids, when received, are not considered.

The sale of game, fish and shell-fish in the wholesale market should be given strict surveillance. Thousands of pounds of

fish are condemned every day because of insufficient icing, delays in transportation, or careless and insanitary handling.

Frequent visits must be made to the various cold storage plants throughout the city. The Bureau of Health works in conjunction with the State pure food agents in these plants and large quantities of meats and poultry are seized, condemned and sent to the tanks.

Inspection of Cold Storage Plants Provided For

Some dealers buy meats in large quantities and, when it begins to spoil, place it in cold storage with an idea of saving it. This idea is entirely wrong. If meat goes into the cold storage plant bad, it is bound to come out bad. All the freezing in the world will not help it one iota. The cold storage law forbids this practice and these cases are disposed of by State pure food agents. Some dealers use cold storage plants as a defense against inspection, believing that the meat inspector has no authority to conduct inspections where articles are not offered for sale.

During the summer months one of the inspectors wished to visit a cold storage plant and when he made himself known to the superintendent was refused admission. After reporting what had happened a detail of police was thrown about the plant and no articles were allowed to go in or out. Needless to say, in two hours the superintendent changed his mind and four inspectors instead of one visited the plant.

When questioned as to why admission was refused to inspectors a reply was made that the inspector had no authority to enter cold storage plants and even after he was shown the Act, which reads, "To provide for the licensing and regulation of slaughter houses, shops, wagons and places where meats, poultry, fish, game and shell-fish are prepared for use as food or stored or exposed for sale in cities of the first class in this commonwealth and providing for penalties for any violation of any regulations governing the same," he could not be made to understand that our power had not been exceeded.

In our own city much interest has been taken in the herd of cattle at our own farm at Byberry. Our first step was the applying of the tuberculin test. The subcutaneous test was first applied and then checked with the interdermal and the ophthalmic test. The results of our test were most gratifying and we are proud to say that the herd at Byberry is clean of tuberculosis.

Conclusions

In conclusion I might briefly state that the qualifications for a meat inspector in a large city must not only include a knowledge of anatomy and pathology but he must be able to know cuts and kinds of meats and fish, as he is called upon to pass on quality as well as edibility. A man must have tact, personality and make an appearance which will appeal to the person with whom he is dealing. Usually the man who talks and boasts too much is least respected and accomplishes the least. He must be able to size up the situation quietly, note the caliber of the man he is handling and act accordingly.

Get the confidence of the people with whom you come in contact and your task is much easier to accomplish.

Does Your Wife Know About The Women's Auxiliary?

GLANDERS

The medical profession of the Czechoslovak Republic has been greatly alarmed by seven deaths due to an infection with malleus within a short period. The original four cases occurred in persons who had been taking care of a horse that was sick with malleus. The first professional infection took place when a necropsy was performed on the horse by the assistant of the school of veterinary medicine in Brno, Dr. M. Derbek. When Dr. Derbek died after a rather prolonged sickness, the suspicion of a chronic infection with malleus was aroused, and blood smears and inoculations were performed during the necropsy by Dr. J. Solc, the assistant of the institute for pathologic anatomy in Prague. Shortly after that, Dr. Solc came down with an acute infection with malleus and died within a few days. The death toll of this dangerous malady was not exhausted yet, because in a short time the death of Dr. J. Purkrabek, assistant director of the institute of serology in Ivanovice, was announced. The deaths are the more significant in that all the three victims were well known in professional circles as renowned investigators. This unfortunate experience emphasizes again the well-known danger of laboratory infection with malleus, because it can be presumed that the infections occurred in spite of necessary precautions, which had probably been taken by these experienced investigators. (*The Journal of the American Medical Assn.*)

THE INTESTINAL PARASITES OF DOGS[1]

By HOWARD CRAWLEY, *Philadelphia, Pa.*

The commoner intestinal parasites of dogs are eight species of tapeworms and four, or possibly five, species of nematodes. The tapeworms are *Taenia marginata, T. serrata, T. coenurus, T. serialis, T. echinococcus, Dipylidium caninum, Mesocestoides lineatus* and *Bothriocephalus latus.*

The nematodes are the two large ascarids, *Belascaris marginata* and *Toxascaris limbata*; hookworms, of which there may be two in American dogs, although they are always credited to *Ankylostoma caninum,* and the whipworm, *Trichocephalus depressiusculus.* The general impression is that nearly all dogs are parasitized by one or more of the above named species, but this is not altogether borne out by the published evidence.

The more important statistical papers bearing on the dog and his intestinal parasites are here reviewed.

Schoene[1] gives the following percentage for dogs in Saxony, the actual number of animals not being available.

Taenia marginata	27%
T. serrata	15%
T. coenurus	1%
Dipylidium caninum	25%
Ascaris	24%
Hookworms	1%

Deffke[2] posted two hundred dogs at Berlin, his findings being here appended:

Taenia echinococcus	2 or 1 %
Taenia coenurus	1 or ½%
Taenia marginata	14 or 7 %
Taenia serrata	10 or 5 %
Dipylidium caninum	80 or 40 %
Ascarids	37 or 18½%
Hookworms	9 or 4½%

The results obtained by these two authors, so far as the tapeworms are concerned, are included by Stiles (see below). As regards the very small percentage of hookworms and the lack of whipworms, we may probably conclude that these are due rather to oversight than to the failure of these parasites to occur at all frequently in European dogs.

Sommer[3] obtained the highest percentage of infestations, forty-eight out of fifty dogs. These animals, however, came from the Washington pound; hence were mostly stray street

[1]Contributions from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 17. Received for publication, January 31, 1924.

dogs, and such undoubtedly are the most highly parasitized. In detail, Sommer's figures were as follows:

Total dogs examined	50
Total dogs parasitized	48
Cestodes	26
T. serrata (*pisiformis*)	6
T. marginata (*hydatigena*)	1
Dipylidium caninum	22
Nematodes	44
Ascarids	14
Hookworms	28
Whipworms	35

It is quite evident from Sommer's figures that many of his dogs showed multiple infestations, but the details are not given.

Stiles[4] gives data with regard to the incidence of tapeworms. In twenty dogs examined at Lincoln, Nebraska, *T. marginata* was found once, *T. serrata* nine times, *T. serialis* once, and *D. caninum* thirteen times.

The other records given by Stiles are from Iceland, Europe, and Australia. Throughout, *D. caninum* was the most abundant cestode, occurring in from 21 to 90 per cent of the cases. This last percentage was given by dogs at Lyons, France, and Adelaide, Australia. It is perhaps worthy of mention that the very dangerous *T. echinococcus* was abundant both in Iceland and Australia, but it is fortunately very rare in the United States. The gid tapeworm was present in 19 per cent of Iceland dogs, and in 5 per cent of a lot examined in Copenhagen, but was rare elsewhere. *Mesocestoides lineatus* was also reported from Iceland and Australia, respectively in 21 per cent and 7 per cent of the dogs examined.

In none of the cases just quoted was any information given as to the source of the dogs examined.

Hall[5] reports on 102 dogs from the Detroit city pound. They were nearly all mongrels and presumably nearly all strays.

Hall's findings are here tabulated.

Total number of dogs	102
Fecal examinations negative	28
Postmortem examinations positive	67
Dipylidium caninum	31
T. hydatigena (*marginata*)	2
T. pisiformis (*serrata*)	2
Ascarids	47
Hookworms	23

Wigdor[6] reports on one thousand dogs. His results are based on fecal examinations, the dogs being those imported into the United States from abroad. It is therefore safe to conclude that they were in all cases well-cared-for animals.

His results are as follows:

Total dogs examined	1000
Negative	540
Positive	460
Dipylidium caninum	36
T. pisiformis	68
T. hydatigena	18
T. serialis	15
T. coenurus	1
Undetermined taenias	50
Toxascaris limbata	193*
Belascaris marginata	65*
Whipworms	15
Hookworms	86

Curious features here are the low incidences of *D. caninum* and whipworms.

To the above may be added the results of the fecal examinations of one hundred dogs, made at the laboratory of the Pennsylvania Bureau of Animal Industry. The material was in all cases sent into the laboratory by veterinarians, and the animals furnishing it were purebreds with good homes. But the fact that they were under veterinary care was proof that they were ailing in some fashion or other, and the feces were sent in for examination to determine if the ailments were due to intestinal worms.

Since the purpose of the fecal examination was purely practical, and since from this point of view it does not matter whether a dog has *Toxascaris* or *Belascaris*, the eggs of these two genera were not at first distinguished. It later occurred to the author, however, that it was desirable to make this distinction, and from the ninth case onward it was done.

The statistical data are tabulated below:

Total cases	100
Positive	60
Negative	40

It is to be understood that these were not dogs taken at random, but animals whose condition had presumably warranted the calling in of a veterinarian. It is further to be kept in mind that these conditions were such that parasites could reasonably be expected after expert examination of the physical symptoms. Since, then, only 60 per cent were parasitized, the value of a fecal examination becomes evident, since it relieves the remaining 40 per cent of ailing animals from the drastic infliction of a dose of anthelmintic.

*Wigdor gives 258 cases under the heading of ascarid infestation, and says that *Toxascaris* was three times as abundant as *Belascaris*.

The number of times each particular worm was found is shown in the following table:

Hookworms	31
Ascarids	29
Whipworms	25
Tapeworms	7
Coccidia	1

Thus there were 93 cases of infestation in the 60 infested dogs. Of these, 34 harbored but one parasite, 18 harbored two, and 6 harbored three. The details follow:

Hookworms alone	13 cases
Whipworms alone	7 cases
Ascarids alone	8 cases
Tapeworms alone	6 cases
Hookworms and ascarids	6 cases
Hookworms and whipworms	6 cases
Whipworms and ascarids	6 cases
Hookworms, whipworms and ascarids	6 cases
Tapeworms and ascarids	1 case

Of the ascarids, twelve were *Belascaris*, nine *Toxascaris*, and the remaining eight not determined. Of the seven tapeworms, five were *Dipylidium caninum*, while two were undetermined. In one case in which tapeworms occurred in association with other worms, it was one of the undetermined forms in association with both *Toxascaris* and *Belascaris*.

It is to be observed that in six of the seven cases, tapeworms were the only parasite present, as revealed by fecal examination. It might therefore be suggested that the presence of tapeworms tends to prevent a nematode infestation, but the data are too scanty to warrant any conclusions.

It is evident, however, that so far as the nematodes themselves are concerned, the presence of one is without influence on that of another. The three kinds considered, all of which occur with much the same frequency, may be paired in three ways, and the table shows that all three of these pairs occur with the same frequency.

From all of the data given, the conclusion seems to be warranted that of dogs which are well cared for, about half are parasitized, while for strays the percentage rises to nearly one hundred.

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ACTINOMYCOSIS OF THE OMENTUM AND PERITONEUM

By Wm. H. Feldman, *Fort Collins, Colo.*

Assistant Pathologist, Colorado Agricultural College

The pathology of most of the common infectious diseases has been rather thoroughly worked out, and only occasionally does an observer record some new or different manifestation of these well-studied disturbances. It is apparent, however, that variation and modifications are in evidence in the realm of disease, as well as among the more beautiful things of life, and that nature is continually doing the unexpected, by presenting familiar lesions in an entirely new setting. As a result, one is impressed with the importance of being constantly alert to the possibilities of the additional knowledge to be gained in the ever-widening field of pathological observation.

Very few infectious diseases have been subjected to closer scrutiny during the past fifty years than actinomycosis, especially as this disease affects cattle. The pathological histology of the alterations produced by *Actinomyces bovis* has been well understood for a good many years, and a great amount of compilation has given us information as to the probable locations where the anatomical changes are likely to occur. It is in this last regard that the subject of this report may prove of interest.

Various observers have reported the nodular lesions of actinomycosis as occurring rarely in the following: esophagus, omasum, reticulum, intestines, lungs, spleen, kidneys, brain, testes, uterus, vagina, bladder, bones, muscles, and peritoneum, but as far as can be ascertained, no one has reported the lesions of this disease as occurring in the great omentum. While undoubtedly lesions similar to those mentioned in this report have been observed, it is possible that they were not recognized as actinomycotic, or if their true character was understood, perhaps the case was not reported.

Case Report

A liberal portion of the great omentum of an old, grade cow, which had been slaughtered for food, was presented at the laboratory by the writer's brother, Dr. G. G. Feldman, Spokane, Wash., for the diagnosis of a multiple nodular formation scat-

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tered promiscuously throughout the structure (fig. 1). (In addition to the lesions in the omentum, the necropsy report showed that the entire peritoneal surface was studded with these nodular formations.) At the time of removal, the nodules were of a pinkish-white color, of firm consistency, having a smooth surface, and a great many of them were attached to the omental tissue by short pedicles. Their shape varied, being in general oval and somewhat flattened, while a few were nearly spherical. In size they varied from 0.4 mm. up to 1.5 mm. (fig. 2).

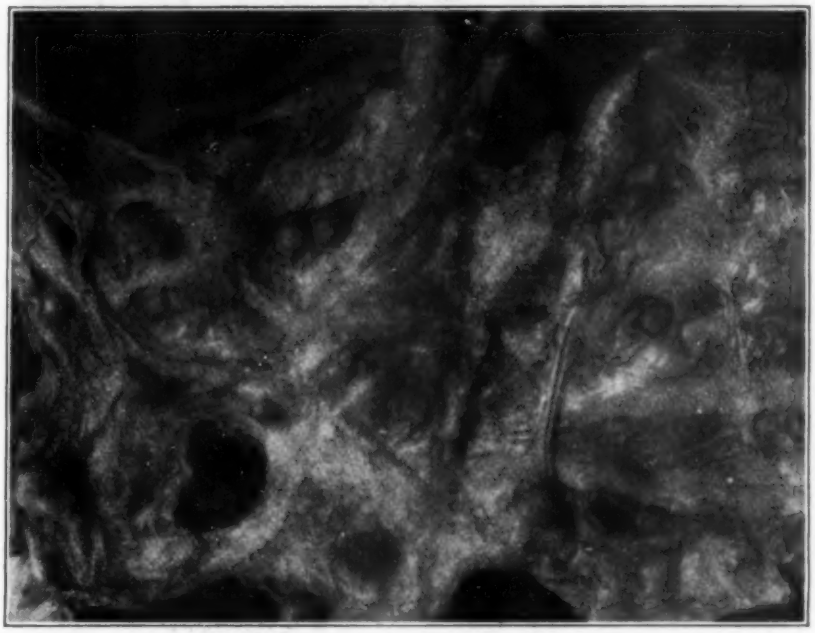


Fig. 1. Portion of omentum showing actinomycotic nodules in situ.

The serous covering was rather loosely attached, and appeared wrinkled in many instances.

Pathological Histology

Sections from these nodules were stained with hemotoxylin and eosin, and the typical rosette formation, characteristic of *Actinomyces bovis*, was evident in great abundance (fig. 3).

It is interesting to note that most of the ray fungi were located in an intermediate zone between the center of the nodule and the peripheral connective tissue or wall. Few giant cells could be determined in the immediate vicinity of the rosettes, although

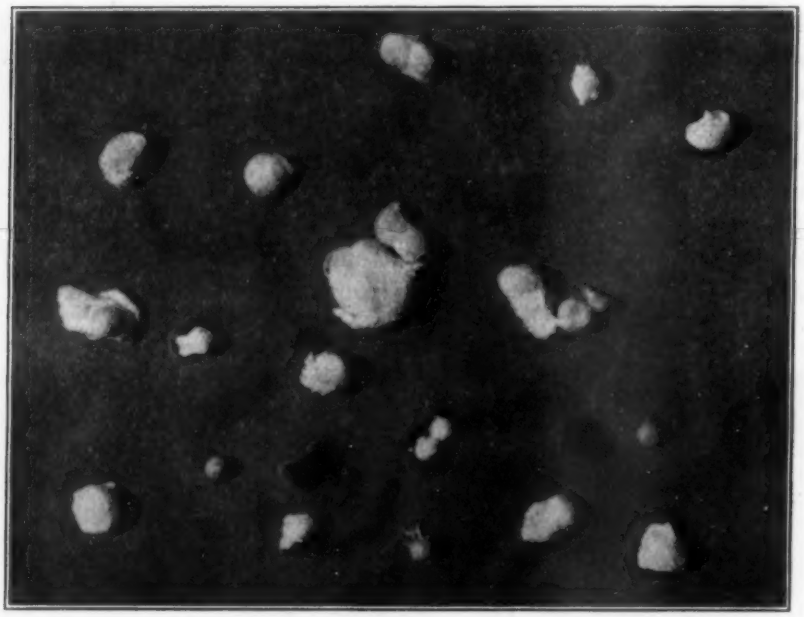


Fig. 2. Detached nodules showing irregularity of shape and size.

a few were present in the dense connective tissue in the central portion of the nodules. Leucoyctes of the polymorphonuclear

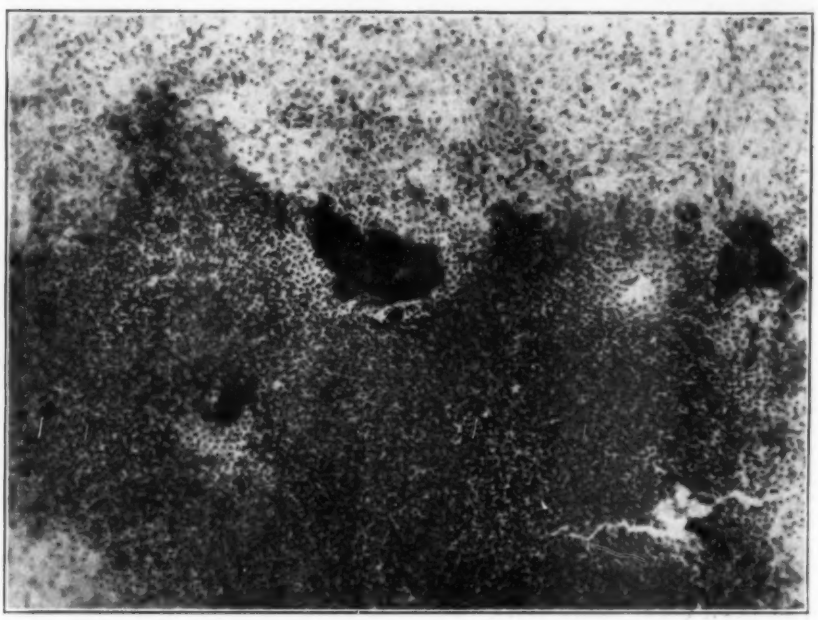


Fig. 3. Low-power view of portion of nodule showing ray fungi and accumulation of leucocytes

variety were present around many of the rosettes in immense numbers (fig. 3). Of some interest was the alveolar-like arrangement of the connective tissue surrounding many of the individual rosettes (fig. 4).

The connective tissue was quite abundant throughout the entire structure, which is typical of the lesion produced by this organism. External to the zone of rosettes the connective tissue was laid down in very definite strands, between which were large numbers of lymphocytes (fig. 5).

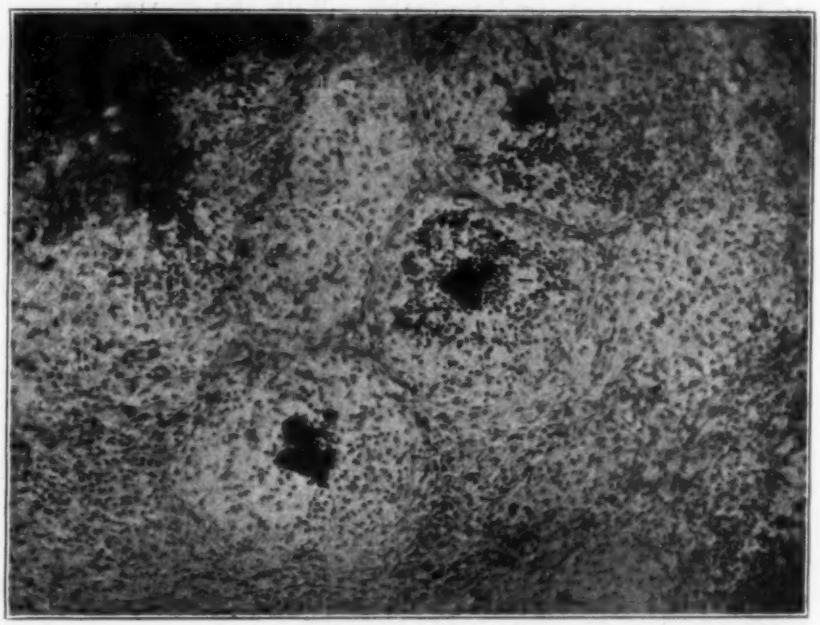


Fig. 4. Low-power view of section showing alveolar arrangement of connective tissues surrounding the rosettes.

Red corpuscles were fairly abundant throughout the connective tissue, not only in the wide peripheral zone but in the central portion of the nodules as well. In addition, many of the nodules showed well-defined blood vessels near the edge of the formation, just beneath the serosa. The serosa proper of many of the nodules was greatly thickened, the enlargement being due to an increase in the connective tissue elements of the membrane (fig. 6).

This structure was more or less loosely arranged, and differed in this respect from the dense connective tissue of the nodule wall proper. (Compare figures 5 and 6.) An interesting feature of the serous layer was the well-developed blood vessels, and

the large number of young capillary buds appearing throughout the structure. The presence of these young vessels would indicate an active attempt on the part of the body further to wall off or encapsulate the infection.

In the consideration of the unusual location of this common disease, one is at a loss to know how to explain the apparent restriction of the infection to the serous membranes of the abdominal cavity. With such an extensive involvement of these parts, one would expect to find lesions of the disease elsewhere—in the liver, lungs, or lymphatics. With the disease in some other region of the body, it might be possible to account for the

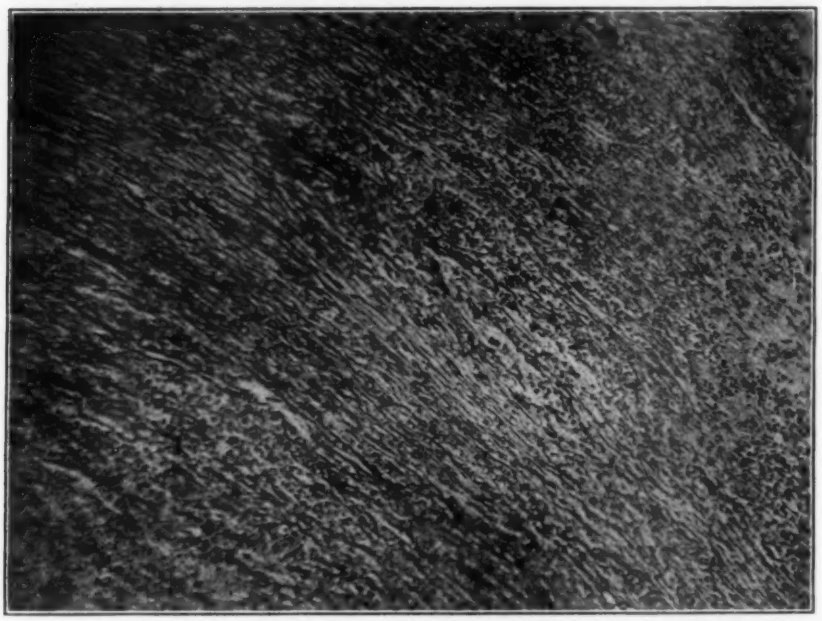


Fig. 5. Section of nodule wall, showing dense strands of connective tissue and large numbers of lymphocytes

pathogenesis of the infection in this instance by metastasis, via the blood or lymph stream. However, with the rest of the carcass apparently free from the disease, one must look elsewhere for the source of entry of the causative organism.

It is possible that the infectious agent was introduced through the walls of the alimentary tract, by a puncture of the soft tissues, such as could result from sharp food particles, which can be found all the way from the rumen to the colon in practically all bovines whose rations consist largely of dry roughage.

Another explanation might be the conveyance of the infection by the blood supply of the mesentery, and its distribution to the adjacent serous membranes by the blood stream. However, in this case, one would expect to find lesions in the mesentery as well.

Fig. 6. Low-power photo-micrograph of serosa, and adjacent nodular wall, showing the extreme thickness of the membrane; large blood vessels and new capillary buds.

Any hypothetical attempt to explain a proposition of this kind is always unsatisfactory and very apt to lead the one who attempts it into the zone bordering the mythical, and as a consequence, false conclusions are apt to be made without the necessary facts in justification.

POULTRY PATHOLOGICAL STUDIES

By B. F. KAUPP *and* R. S. DEARSTYNE

From the Poultry Pathological Laboratories of the North Carolina State College, Raleigh, N. C.

1. AURICULAR DILATATION OF THE HEART OF A SINGLE COMB RHODE ISLAND RED COCK

History of the Case.—A Single Comb Rhode Island Red cock was sent to the laboratory for autopsy with no record of clinical history other than that the bird became dull, loss of appetite, gradually became poor and finally died.

Postmortem findings.—There is passive congestion of the comb, face, and wattles. A chronic inflammation of the left foot is present. The liver shows slight enlargement and passive congestion. The kidneys are in a state of passive congestion. Fig. 1 shows a picture of this heart. At A is shown the auricular dilatation, which is enormous, the heart apparently stopping in a state of diastole. The dilated portions of the heart are filled

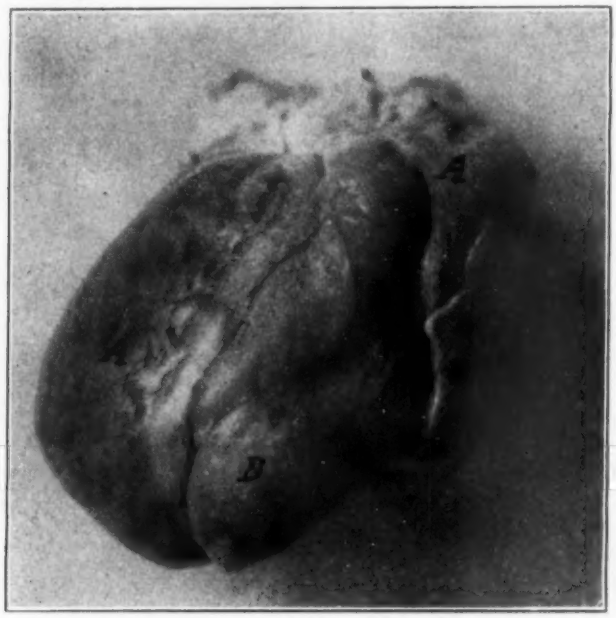


Fig. 1. Auricular dilatation of the heart of a S. C. Rhode Island Red Cock. A, the enormously dilated auricles containing blood; B, the ventricular portion of the heart.

Received for publication, April 28, 1924.

with coagulated blood and the entire heart with its blood weighed 140 grams. At B in the picture is seen the ventricular portion of the heart.

2. A Horny Growth on the Shank of a Hen

History of the case.—Prof. E. N. Meekins, of the Carey High School, sent to the laboratory a Barred Plymouth Rock hen, about three years of age, with a history that she had been a member of a town flock and that a horny growth had been gradually developing on the anterior portion of the right shank. This horny growth was several months in developing and involved the entire structure from the foot to the hock. Figure 2 is a picture of this case.

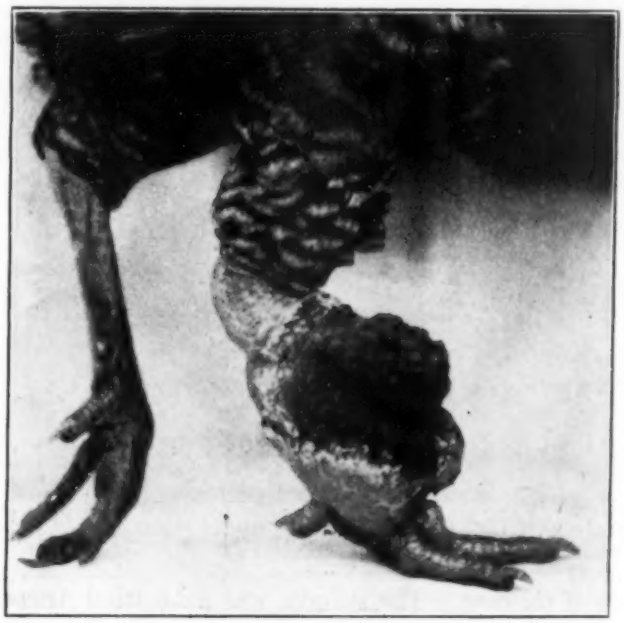


Fig. 2. Horny growth on foot of Barred Plymouth Rock hen.

Horny growths are occasionally seen in the fowl, the senior author in this report having described one on the dorsal side of the foot of a Barred Plymouth Rock hen in *Veterinary Medicine*, Chicago, (Vol. XVIII, No. 12). There was also reported a horny growth from the thigh of a fowl. This report appeared in *The Veterinary Journal*, London, England, in July, 1916.

3. Favus of a Mottled Ancona Cock

*Cause of disease.**—Favus, also called honey-comb, ringworm, or tinea favosa, is caused by a fungus *Achorion Schoenleinii*. The fungus somewhat resembles *Oidium albicans*, appearing as a mat or mycelium consisting of hyphae or threads, and reproducing by spore formation.

The hyphae are microscopic in size and have ramifying branches with tapering ends. The hyphae are matted together forming mycelia or mat-like masses. The spores or seeds are found in masses in the meshes of the mat-like structure.

Fig. 3. Favus in Ancona Cock.

History of the case.—The subject was a Mottled Ancona cock, one year old, that belonged to a "string man." At the time the bird was brought to the laboratory only the comb was affected and antiseptic ointment had been used. After the bird had remained in the hospital for two or three weeks the disease again appeared and this time extended down the neck causing the feathers of the head and upper neck to fall out.

Symptoms of the case.—The disease proved highly contagious, as two Single Comb White Leghorn cockerels, occupying a coop

*Kaupp, B. F. Poultry Diseases, 3rd edition, Alex Eger, Chicago.

about six feet distant, contracted white comb, the spots commencing as small, white, scaly appearing patches which gradually spread, coalescing, and finally covering the whole comb. It is said that the disease may extend to the body but in these cases studied this did not happen. Figure 3 shows the disease in the Ancona male. The diseased areas are covered with a scale which is depressed in the center and with edges upturned. This is plainly seen on both the comb and top of the neck. This gives the patch a cup-like appearance. The scales may pile up until they become quite thick. The feathers affected become dry, erect, brittle and break off at the surface leaving the denuded areas as shown in the picture. As the disease progresses the bird loses appetite, becomes poor in flesh, emaciated and weak, and finally dies.

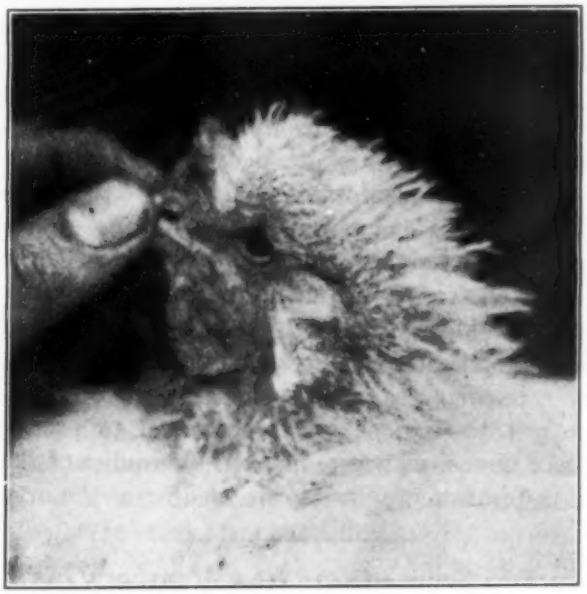


Fig. 4. Acute dermatitis in a chick.

4. Acute Dermatitis in a Leghorn Hen

Dermatitis is not a common disease in the fowl. Recently two such cases from widely separated localities have been observed.

History of the case.—A local poultryman brought a Single Comb White Leghorn hen to the laboratory for examination.

Symptoms of the case.—The skin in the entire neck region including the head was in a state of acute inflammation with

some edema of the skin. Figure 4 shows a picture of this hen. The bird gradually lost appetite, grew weak, and finally died. There was no definite cause that could be attributed to this case.

5. THE OCCURRENCE OF B. PYOCYANEUS (PSEUDOMONAS AERUGINOSE) IN THE FOWL

Very little can be found in regard to the occurrence of *B. pyocyaneus* in the fowl and the injury it does. The bacillus was first observed in green pus. It has also been shown to be a common saprophyte in the outside world. It has been isolated from sewage, manure, water, air and the intestinal contents of man, birds and the domestic animals, especially the dog. It is also present in rooms, hospital wards, and barns.

It generally lives as a harmless commensal in the intestines of man and animals but in ill nourished children has been known to invade the organism from the intestine and in a few cases to have caused general septicemia and death. It produces general septicemia when inoculated into the guinea pig.

It is frequently found in pus where it gives a greenish color. The pathogenic properties of *B. pyocyaneus* is due to a soluble toxin and an insoluble endotoxin.

Observations in this laboratory.—Of 300 autopsies on adult fowls *B. pyocyaneus* was isolated from four cases. In three the organism was isolated from the lungs and from the fourth from the liver, heart, and kidneys. On three separate occasions attempts were made to reproduce the disease in young fowls by giving 5 cc per os, of a bacillary saline emulsion made from a 24-hour-old, agar-slant growth. In each case it failed to produce clinical symptoms of disease as was evidenced by studies of the temperatures and respirations following the feeding of the organisms.

Have You Secured One New Member This Year?

WAY DOWN IN GEORGIA

Here is an ultimatum posted on a farm in Georgia which speaks for itself:

"Trespaser's will be persekuted to the full extent of 2 mean mongral dogs which ain't never been ovarly soshibil with strangers and 1 dubbel barelt shot-gun which ain't loaded with no sofy pillers. Darn, if I ain't tired of this hel raisin on my property."

USE OF FILTERING TRAYS FOR COLLECTING AND COUNTING PARASITIC WORMS

By H. W. GRAYBILL, *Department of Animal Pathology,*

*Rockefeller Institute for Medical Research**

In following the procedure of collecting the smaller helminths of the alimentary tract, either at autopsy or in the feces, following an anthelmintic, by washing and sedimenting ingesta or fecal material in water until the supernatant fluid is clear, the examination of the final sediment is generally made by pouring it all or in fractions, as circumstances may render more suitable, into a glass tray, thus rendering it easy to see and pick out any parasites present.

For convenience in picking out all worms or counting without the labor of picking them out, a glass filtering tray has been found especially useful. This usefulness lies in the fact that the bottom of the tray is provided with diagonal parallel ridges 1.3 cm. apart. These serve as guides, making it possible to begin at one corner and examine the entire bottom of the tray systematically, without danger of omitting portions or of examining some twice. In the same way, should one not care to save the worms, it is possible, if the sediment is sufficiently diluted, to count them in place without resorting to the tedious task of picking out.

These trays are 10 x 10 inches. In one corner of the bottom there is a hole, which can be readily closed with melted paraffin or in some other suitable way.

The trays without a stand, which is not necessary for the use suggested here, are quoted by the manufacturer at $3.25 f. o. b. They are listed by some concerns dealing in scientific apparatus, and there will probably be no difficulty in obtaining them through any firms handling equipment of a similar nature.

Have You Secured One New Member This Year?

A BAD CASE

Old Timer: "I once knew a man who stayed home with his wife every night for thirty years."

Old Timer's Wife: "Ah, that was true love!"

Old Timer: "Oh, no, it wasn't; that was paralysis."

*In cooperation with the Division of Veterinary Science of the University of California.

SOME VETERINARY REMINISCENCES

II. Testing the Tick Theory

By N. S. Mayo, *Chicago, Ill.*

It must be remembered that in the early nineties relatively little research work had been done on transmissible animal diseases and what we did *not* know was much greater than at present. It is only by comparing our knowledge then and now that the splendid progress in solving the problems relating to animal diseases can be appreciated. Hog cholera, Texas fever, "mad staggers," "mad itch," loco disease, cornstalk disease and forage poisoning were among the diseases that caused great live stock losses. An experiment station veterinarian was expected to take a "look see" and solve the mystery at once. The experiment stations were anxious to make good and demonstrate a reason for their existence and one simply *had* to make discoveries.

It was the custom among some of the western colleges at that time to saddle on to a new member of the teaching staff subjects that none of the older faculty members wanted. Consequently, in addition to veterinary science, I taught human anatomy and physiology, geology, zoology, was curator of the college museum and director of athletics. I hesitate to express an opinion as to the thoroughness of the work or what the students got out of it, but it was splendid training for me. I still recall with pleasure a joke that a very attractive young lady in a physiology class sprung on me. I was quizzing her on "taking cold" and said, "Suppose, Miss K., you were at a party in evening dress and danced until you were perspiring freely and then strolled out on the veranda, what might happen?" There was a twinkle in her eye when she said, "Excuse me, professor, I'd rather not tell what *might* happen."

Dr. Billings had been re-employed at the University of Nebraska and was publishing a large number of bulletins on animal diseases. I knew Dr. Billings well, as he was supposed to give a course of lectures to the students of the Chicago Veterinary College. There were mostly tirades against Dr. Salmon. Dr. Billings had a private laboratory in Chicago, while I was a student there, and I did some work under him that was really valuable. He was one of the finest microscopic manipulators I ever saw.

Before going back to Nebraska, about 1890, Dr. Billings thought, or claimed, he had a vaccine to prevent hog cholera. Some Chicago capitalists furnished the money and they established a hog sanitarium, purchased hogs and vaccinated them, but the hogs died and so did the partnership.

When Dr. Billings got back to Nebraska he published a bulletin on "Cornstalk Disease," in which he claimed that the Burrill bacterial corn disease was the cause of cornstalk disease. I also worked on the Burrill corn disease and demonstrated that this organism did not cause "cornstalk disease" of cattle. Many years later I learned that this bulletin of mine played a not unimportant part in overcoming objections raised by a foreign government against the importation of American cattle.

Another duty that fell to the lot of a college veterinarian was to assist at farmers' institutes in various parts of the state. The first institute that I ever attended in Kansas stands out vividly in my memory. Hog cholera had been prevalent that year and it so happened that I had sent to a farmer a remedy to be tested out. This remedy had been recommended to me by Dr. Paquin of Missouri. I do not recall what the remedy was, except that it was an intestinal antiseptic dissolved in benzol. I evidently did not give the farmer detailed directions as to how it should be administered.

After I had delivered my "lecture" on hog cholera, my farmer friend got up to give his experience. He was an Irishman, with a brogue that would bring tears anyway, and when he described in detail how he had held the sick pigs up by the ears and given a dose of the "distinguished professor's wonderful cholera cure," and how every pig gave "three hiccoughs and two kicks" and had no more cholera "because he died immediately." I am sure it is not necessary to give more painful details, but after some time the president was able to restore order and continue the meeting. I always have been thankful that the good Lord gave me full measure of the sense of humor. It has smoothed many rough places in life's pathway. I love a joke, even on myself.

We Have Room For A Thousand New Members This Year.

FALSE DOCTORIN'

School Examiner: "What is the meaning of false doctrine?"

Schoolboy: "Please, sir, it's when the doctor gives the wrong stuff to the people who are sick."

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

RABIES IN SEVENTY HEAD OF CATTLE

By I. E. NEWSOM, *Fort Collins, Colo.*

Laboratory of Veterinary Pathology, Colorado Agricultural Experiment Station

My first knowledge of an outbreak of rabies in cattle, which has caused considerable interest in Colorado, came as a result of a letter from Dr. W. F. Fisher, of Walsenburg, Colorado, under date of January 15. At this time he sent tissues for a laboratory examination, accompanied by the following history:

> "I was called to see this animal, January 13, and the following symptoms were in evidence: Temperature, 94; respirations, 20; pulse, 30; the animal had diarrhea, the coat was rough, the eyes were sunken and the penis protruded from the sheath.
>
> "The following history was obtained from the owner, Mr. Henry Schmidt, of Gardner, Colo. To date, out of three hundred head, Mr. Schmidt has lost fifty-five head, in approximately three months, and the cattle are still dying.
>
> "The owner described the symptoms of the disease: The disease does not seem to affect the younger stock in any large numbers. They quit eating, some of them will try to fight the dog or any animal that is around, while others seem to be in a comatose condition. In some there is a drooling of saliva, while others are not affected with this symptom. The animals strain, some of them apparently go blind, some seem to be paralyzed in the hind quarters, and others stand and bawl continuously until they die.
>
> "The following conditions were in evidence when the animal was posted: The trachea was full of foam, the stomachs were about empty, there were no hemorrhages over the pleura, the lungs were collapsed, the bladder was distended, there was no fluid in the peritoneal cavity, there were numerous petechial hemorrhages over the intestines, otherwise nothing seemed abnormal."

A rabbit was inoculated with tissue emulsions from this material, but with negative results and a report was so made to Dr. Fisher. Apparently the animals continued to die until May 5, when, through the energetic action of the secretary of the local cattle association, Dr. C. G. Lamb, State Veterinarian, Dr. W. E. Howe, Inspector-in-Charge, Field Division, Bureau of Animal Industry, at Denver, and I made a visit to Walsenburg, arriving at the ranch, where the cattle had been dying, on the 6th.

From statements of the owner we elicited the information that he had originally owned some 300 head of cattle but, during

the past year some 70 head had died of a malady which they did not understand. During this time the cattle had been on two different ranches about 5 miles apart, and during the summer had been ranging on the Forest Reserve. There seemed to be no difference in frequency of deaths, whether the animals were on the upper or lower ranch, or whether they were running at large. The upper ranch was at an altitude of about 9,000 feet and the lower ranch about 1,000 feet below. Both are about 45 miles from Walsenburg.

Apparently animals of all ages had been affected although nothing under six months was diseased. The duration of the disease was from one to 12 days. About 75% of the animals would bawl, but the others made no sound. All of them became paralyzed for some hours before death. On arrival at the ranch, of the two animals that had been sick, one had died the night previously and the other was down and unable to rise. The animal that was still alive was a two-year-old heifer that showed no particular symptoms other than inability to rise. This animal had not eaten anything since taking sick and as she had been sick for some eight days it was thought that she might be down because of weakness. Three thermometers were used in taking the temperature, but there was no rise beyond the minimum point, so that we were unable to determine just exactly what the temperature really was. She was killed and a postmortem examination made which revealed very little that was typical in the way of lesions. There were a few hemorrhages in the omentum and a considerable hemorrhagic vaginitis. Outside of this everything appeared to be normal An examination of the animal that had died the night before revealed numerous subepicardial hemorrhages, with only a slight reddening of the vaginal mucous membrane.

A careful examination of the hay revealed a good deal of sage and a plant which was thought to be milkweed, but later examination showed this presumption to be in error. The brain was removed from the heifer, along with many other tissues, and brought to the laboratory for examination. It revealed Negri bodies in large numbers, whereupon a diagnosis of rabies was made. A rabbit inoculated on May 8 came down on the 24th, also revealing the presence of Negri bodies.

During the past winter a wide-spread outbreak of rabies, both in coyotes and dogs, has been prevalent in this district, our laboratory having received one coyote head and one dog head

showing the presence of Negri bodies. Dr. Howe tells me that the United States Biological Survey has had hunters in the district for several months, during which time they have destroyed some 300 coyotes, 8 of which were shown to be rabid.

The assumption is that the cattle were bitten either by rabid dogs or rabid coyotes, although as far as the owner knows no rabid animals were seen in this immediate vicinity. Some neighbors had lost a few cattle but probably not to exceed five or six all told. There is of course some question about the diagnosis covering all of the cases, but from the symptoms given by Dr. Fisher, and those given by the owner, we are of the opinion that rabies was responsible for most if not all of the cases.

Plan To Go To Des Moines, August 19-22.

ANOTHER CASE OF RUPTURED DIAPHRAGM IN A COW

By JOHN B. BRYANT, *Mount Vernon, Iowa*

The report of Dr. Donham's case, captioned, "Rupture of the Diaphragm in a Cow," was very interesting to me, inasmuch as I observed a similar case in a dairy cow.

My patient was a three-year-old Jersey heifer, in lactation. A persistent cough prompted the tuberculin test, which proved negative. From this on, the cow declined rapidly, breathing became labored, movements slow, lactation abandoned.

Medicinal procedures were of no avail and the case was discharged as incurable. My reserved diagnosis was pulmonary tumor or abscess with malignancy. The duration of morbidity, from the time of the tuberculin test until death supervened, was a little over one month.

Postmortem examination exhibited rupture of the diaphragm, with protrusion of a mass of liver the size of a double fist into the thoracic cavity. The strangulated liver tissue and that of the lung adjacent were in a state of gangrenous liquefaction. The lungs were fairly saturated with the dirty-brown, foul-smelling, putrefactive material, which brought on a gangrenous pneumonia, which finally caused the death of the victim.

The owner of this cow was killed in an auto accident just previous to my first observation of this case, hence a reliable history was not available. This I know, that the cow was

recently fresh and although there was no report of inconvenience during delivery or immediately following same, yet it appears that diaphragmatic rupture during the act of parturition was a fact in these two instances—that of Dr. Donham, reported in the June issue of the JOURNAL and the one reported above.

Have You Secured One New Member This Year?

TROPICAL ULCER AND SUMMER SORES

In a recent article,[1] Dr. Corpus, Medical Inspector, Philippine Health Service, in a survey of tropical ulcer, concludes as follows:

1. Tropical ulcer is believed to be caused by some form of spirochetes of Eggert's type A.
2. The disease is contagious, being usually found among school children who are in constant contact with one another.
3. The most effective treatment is arsphenamine (3% solution) supplied locally, and the next is Vincent's powder.

The appearance of the ulcers, as shown in the illustrations accompanying Dr. Corpus' article, is so characteristic of the so-called "summer sores of animals that they at once suggest a possible similarity of cause. We hope that if some of our readers have to treat cases of summer sores they will have these examined for spirochetes, and if this is not practical, to try a 3% solution of arsphenamine.

N. S. M.

(Investigations have shown that "summer sores," in some cases at least, show the presence of larval nematode worms belonging to the genus *Habronema*. Editor).

Does Your Wife Know About The Women's Auxiliary?

DEATH FOLLOWS BITE OF HOG

The reported case of a man having died, near Red Wing, Minn., recently, following a bite on the thumb, inflicted by one of his hogs, is suggestive of the condition sometimes seen in hogs following vaccination, in which extensive swelling occurs, with gas formation. Meyer suggested the designation "specific gas phlegmon of hogs," for such conditions, when caused by the Ghon-Sachs bacillus.

[1]Jour. A. M. A., 82, 15.

ABSTRACTS

THE ANTIRACHITIC INFLUENCE OF EGG YOLK. Horton Casparis, P. G. Shipley and Benj. Kramer, Jour. Amer. Med. Asso., lxxxi (1923), 10, p. 818.

Under this title the authors have written an excellent article, in which their conclusions are as follows:

1. Rickets is not beneficially influenced by a diet of milk and cereals.

2. The addition of one or two eggs a day to such a diet will initiate healing which is usually evidenced within three weeks after the egg feeding is begun.

3. The chemical changes in the blood serum and the roentgenographic changes in the bones are similar to those which follow the administration of cod liver oil.

4. The addition of 10 per cent egg yolk to a ricket-producing diet will initiate healing of rickets in a rat in six days.

These facts should be of special interest to small animal practitioners who have this condition to combat frequently.

N. S. M.

COCCIDIOSIS OF CATS AND DOGS AND THE STATUS OF THE ISOSPORA OF MAN. C. M. Wenyon (1923). Ann. of Trop. Med. and Parasitol. (Liverpool & London), 17 (2), pp. 231-288, pls. ix-xiv, text figs. 1-2.

Wenyon has made a careful restudy of the coccidia of dogs and cats, and comes to the conclusion that the parasites which have often been reported under the name of *Isospora bigemina* or *Diplospora bigemina* are actually separable into three species, the smallest of which is *Isospora bigemina* Stiles, 1891, the largest *I. felis* Wenyon, 1923, and a species of intermediate size *I. rivolta* Grassi, 1879. He also describes a new species of *Eimeria* (= *Coccidium*), *E. canis* Wenyon, 1923, from the dog. The oocysts of *I. bigemina* are about 12 to 15 μ long, those of *I. rivolta* are 25 to 30 μ long, and those of *I. felis* are about 40 to 45 μ long, though the sizes actually reported for various forms often fall outside of this range of measurements. In a study of the intestine of a cat infected with two species of *Isospora*, Wenyon found that *I. bigemina* underwent and completed its development in the submucosa, as Stiles had shown for this

species, but that *I. felis* underwent its development in the intestinal epithelium and did not become a resistant oocyst until it left the epithelium for the intestinal lumen, and the oocyst did not contain formed sporoblasts or later stages while in the epithelium or the intestinal lumen. The development of the contents of the oocyst of *I. rivolta*, as in the case of *I. felis*, also takes place only after the oocyst has left its host.

Eimeria canis was found in three dogs, the occurrence of the parasite in these cases having been reported in 1922 by Brown and Stammers. Two animals were lightly infected and one fairly heavily infected. The oocyst has a wide range in size, from 18 to 45 μ long by 11 to 28 μ wide. The cyst wall has a peculiar pink color, the true wall being enclosed in a thick irregular membrane which peeled off during the course of development.

The species of *Isospora* reported from man are regarded as belonging to two species, the small one being *I. hominis* (Railliet and Lucet, 1891) and the large one *I. belli* Wenyon, 1923.

Among the records, Wenyon refers to that of Hall and Wigdor, who reported *E. bigemina* from 15 of 200 dogs at Detroit, Michigan, and noted that they found two strains of which neither agreed in size with the measurements given by Stiles for his *I. bigemina*. Of these two strains, the smaller, found by them in one dog, appears to be *I. rivolta*, and the larger, found in 14 dogs, appears to be *I. felis*.

M. C. H.

ANTHRAX IN MAN

In *La Semana Medica* (Buenos Aires, Argentina), Dr. Rissotto, of the hospital Muñiz, gives some interesting data regarding cases of anthrax in man that have been observed in that hospital. The first case was recorded in 1891; the second in 1896. From that time onward, the disease increased slowly, varying somewhat in different years until 1914, when 39 cases were reported. Anthrax then increased very rapidly, in 1915, 66 cases; 1916, 90; 1917, 166; 1918, 226; then the cases began to decline the middle of the following year.

Of 1030 cases treated in the hospital 953 were men and boys and 77 women. The mortality for men was 13.33% and for women 11.68%. Dr. Rissotto states that direct infection from animals to man is frequent and is usually the result of handling a carcass.

N.S.M.

REPORT OF COMMITTEE ON LEGISLATION

As Chairman of the Legislative Committee, I have the honor to submit to you the following report:

Since our last meeting, we had the misfortune to lose our former Chairman, Dr. F. A. Bolser, of New Castle, Indiana, and the Committee hereby wishes to acknowledge its esteem of the late Dr. Bolser, and its deep regret for his untimely death.

As to legislation enacted since the St. Louis meeting, I wish to report that, outside of the Reclassification Bill, there has been no other legislation enacted which intimately concerns the American Veterinary Medical Association, so far as I know.

As all of you know, the members of the American Veterinary Medical Association, and especially its Legislative Committee representing you, were deeply interested in the Reclassification Bill which has been before Congress for the past several years, since the same was intended for the benefit of employes of the U. S. Bureau of Animal Industry. I now wish to report that, after discussing the subject for several years, Congress passed the bill on March 3, 1923, and, through the courtesy of Dr. J. A. Kiernan, of the U. S. Bureau of Animal Industry, I secured a copy of the letter which is attached hereto, which letter was written to the members of the National Association of B. A. I. Veterinarians. This letter covers the most important items in the bill, affecting the veterinary service.

Other than the above, I have no further report to make on legislative matters.

J. G. FERNEYHOUGH, *Chairman.*

DEAR DOCTOR:

March 17, 1923.

The Committee on Legislation and Publicity takes pleasure in furnishing you herewith a digest of the Reclassification Act of 1923. The various sections are self-explanatory, and no doubt will be left in the mind of the reader as to their intention, except that part of Section 5 which is as follows: "That the compensation schedules shall apply only to civilian employes in the department within the District of Columbia," and the following part of the same section: "The board shall make a survey of the field services and shall report to Congress at its first regular session following the passage of this Act schedules of positions, grades, and salaries for such services, which shall follow the principles and rules of the compensation schedules herein contained insofar as these are applicable to the field serivces."

There is considerable doubt in the minds of some people who have read the bill as to its application to the field service, but your committee interprets the Act to apply to the field service. The bill does not carry with it any appropriation for putting the provision into effect for District employees; that will have to be done in the annual appropriation bill. There is a good deal of similarity respecting the classification of employes in the District under Section 4 and the classifying of field employes under Section 5. A careful study of that will reveal the similarity. We anticipate that when the board reports to Congress, the list prepared by the head of each Department allocating all field positions in his department to the approximate grades in said schedules and fixing the proposed rate of compensation of each employe thereunder in accordance with the rules prescribed in Section 6 of the Act, that the appropriation for field employes will be made on the basis of the reclassification salaries the same as it will be made for District of Columbia employes.

Our association avoided many of the controversies that followed the partisan spirit with which some others advocated the adoption of the Lehlback-Sterling Bill over the Smoot Bill. As was indicated in the committee report which appears on page 8 of News Letter No. 2, there were differences of opinion and judgment between Senator Sterling and Senator Smoot which would have precluded favorable action on the bill unless a compromise was effected Your committee paid very close attention to the progress of the bill in legislation, and take

pleasure in advising that no measure in Congress has attracted more interest from the Senate or received more hearty support from that body during the entire 67th Congress. Virtually no opposition was encountered after the bill was reported to the Senate. Some apprehension was expressed as to the advisability of trying to rush the entire bill thru during the closing hours of the session, but no active unfriendliness was manifest from any source. The action of Congress toward the civil employes of the Government was a broadminded, liberal, humanitarian act, and I am sure that the employes will recognize the confidence placed in them by Congress. There was absolutely no partisan action in respect to the bill; it was virtually unanimous in both Houses.

As to the allocation of positions, the committee is not in a position to give any information at this time. As the work of the board develops, it may furnish information that will be of great interest to our members, and we shall at all times endeavor to obtain authentic information so as to keep our members posted as to their status under the Act.

Yours very truly,

J. A. KIERNAN.

Chairman, Committee on Legislation and Publicity.

(PUBLIC—No. 516—67TH CONGRESS) H. R. 9828

AN ACT To provide for the classification of civilian positions within the District of Columbia and in the field services.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that this Act may be cited as "The Classification Act of 1923."

Sec. 2. That the term "compensation schedules" means the schedules of positions, grades, and salaries, as contained in Section 13 of this Act.

The term "board" means the Personnel Classification Board established by Section 3 hereof.

Sec. 3. That there is hereby established an ex officio board, to be known as the Personnel Classification Board, to consist of the Director of the Bureau of the Budget or an alternate from that bureau designated by the director, a member of the Civil Service Commission or an alternate from that commission designated by the commission, and the Chief of the United States Bureau of Efficiency or an alternate from that bureau designated by the chief of the bureau. The Director of the Bureau of the Budget or his alternate shall be chairman of the board.

Subject to the approval of the President, the heads of the departments shall detail to the board, at its request, for temporary service under its direction, officers or employes possessed of special knowledge, ability, or experience required in the classification and allocation of positions.

Sec. 4. That after consultation with the board, and in accordance with a uniform procedure prescribed by it, the head of each department shall allocate all positions in his department in the District of Columbia to their appropriate grades in the compensation schedules and shall fix the rate of compensation of each employee thereunder, in accordance with the rules prescribed in Section 6 herein.

In determining the rate of compensation which an employe shall receive, the principle of equal compensation for equal work irrespective of sex shall be followed.

Sec. 5. That the compensation schedules shall apply only to civilian employes in the departments within the District of Columbia. * * * The board shall make a survey of the field services, and shall report to Congress at its first regular session following the passage of this Act schedules of positions, grades, and salaries for such services, which shall follow the principles and rules of the compensation schedules herein contained in so far as these are applicable to the field services. This report shall include a list prepared by the head of each department, after consulattion with the board and in accordance with a uniform procedure prescribed by it, allocating all field positions in his department to their approximate grades in said schedules and fixing the proposed rate of compensation of each employe thereunder in accordance with the rules prescribed in Section 6 herein.

Sec. 6. That in determining the compensation to be established initially for the several employees the following rules shall govern:

1. In computing the existing compensation of an employe, any bonus which the employe receives shall be included.

2. If the employe is receiving compensation less than the minimum rate of the grade or class thereof in which his duties fall, the compensation shall be increased to that minimum rate.

3. If the employe is receiving compensation within the range of salary prescribed for the appropriate grade at one of the rates fixed therein, no change shall be made in the existing compensation.

4. If the employe is receiving compensation within the range of salary prescribed for the appropriate grade, but not at one of the rates fixed therein, the compensation shall be increased to the next higher rate.

5. If the employe is not a veteran of the Civil War, or a widow of such veteran, and is receiving compensation in excess range of salary prescribed for the appropriate grade, the compensation shall be reduced to the rate within the grade nearest the present compensation.

6. All new appointments shall be made at the minimum rate of the approrpiate grade or class thereof.

Sec. 7. Increases in compensation shall be allowed upon the attainment and maintenance of the appropriate efficiency ratings, to the next higher rate within the salary range of the grade: Provided, however, That in no case shall the compensation of any employe be increased unless Congress has appropriated money from which the increase may lawfully be paid, nor shall the rate for any employe be increased beyond the maximum rate for the grade to which his position is allocated. Nothing herein contained shall be construed to prevent the promotion of an employe from one class to a vacant position in a higher class at any time in accordance with civil service rules, and when so promoted the employe shall receive compensation according to the schedule established for the class to which he is promoted.

Sec. 13. That the compensation schedules be as follows:

(See schedule as announced in editorial, "Reclassification of Federal Veterinarians," in the JOURNAL, April 1923, pp. 4-5.)

REPORT OF COMMITTEE ON NECROLOGY

The Committee on Necrology has the painful duty to perform this year of recording the deaths of fifty-one members, all of whom were loyal to their profession and to this Association. Some of the departed ones were among the great men of our time, and it is with great sorrow that we realize that we will see them no more. Extended eulogies of them is rendered unnecessary in this report by the more or less lengthy obituaries of them that have appeared in our JOURNAL.

ANDERSON, CHARLES M., d. Jan. 1923, North Portland, Ore. B. Jan. 6, 1888, Council Bluffs, Iowa. San Francisco V. C., 1918. A. V. M. A., 1919.

ASHCRAFT, JAMES B., d. Nov. 17, 1922, Los Banos, Laguna, P. I. B. Dec. 28, 1889, Norwich, Conn. Ohio State Univ., 1920. A. V. M. A., 1921.

ATHERTON, ONESIMUS G., d. Apr. 2, 1923, Fort Wayne, Ind. B. Apr. 13, 1846, Maysville, Ky. Kansas City V. C., 1893. A. V. M. A., 1909.

BIGGS, HERMAN M., M. D., d. June 28, 1923, New York City. B. 1859. Honorary member A. V. M. A., 1890.

BOLSER, F. A., d. Nov. 1922, Newcastle, Ind. B. 1857. Ontario V. C. 1885. A. V. M. A., 1908.

BRACKIN, JOHNATHAN, d. Mar. 28, 1923, Pittsfield, Mass. B. Sept. 3, 1852, Toronto, Ont. Ontario V. C. 1873. A. V. M. A., 1878.

BRANSON, R. A., d. Aug. 28, 1922, Cottonwood Falls, Kans. Kansas State Agri. C. 1911. A. V. M. A., 1915.

BROWN, LLOYD J., d. June 22, 1922, Fort Des Moines, Iowa. B. Feb. 15, 1887, Fletcher, Ohio. Kansas City V. C. 1910. A. V. M. A., 1919.

CARTER, GEORGE H., d. Dec. 25, 1921, Saginaw, Mich. B. Apr. 24, 1856, Guelph, Ont. Ontario V. C. 1888. A. V. M. A., 1911.

COLLINS, ROBERT E., d. Aug. 5, 1923, Memphis, Tenn. Ontario V. C. A. V. M. A., 1907.

COMMINS, FREDERICK E., d. June 21, 1923, San Francisco, Cal. San Francisco V. C. 1910. A. V. M. A., 1915.

DELL, JESSE APPLIN, d. Mar. 28, 1923, Los Angeles, Cal. B. 1858. Ontario V. C. 1881. A. V. M. A., 1910.

DIXON, C. PRICE, d. 1923, Charlottesville, Va. Ohio Veterinary College, 1893. A. V. M. A., 1907.

EMERSON, DANIEL, d. Jan. 15, 1923, Hollis, N. H. Harvard Univ. Vet. School, 1888. A. V. M. A., 1888.

FAREWELL, E. R., d. July 20, 1923, London, Ont. B. June 20, 1879, Drayton, Ont. Ontario V. C. 1902. A. V. M. A., 1919.

FOWLIE, JOHN H., d. Nov. 20, 1922, Ottawa, Ill. B. May 28, 1884, Odell, Ill. Chicago V. C. 1911. A. V. M. A., 1920.

HACKETT, CLAIRE NEWTON, d. Mar. 9, 1923, St. Paul, Minn. B. June 18, 1883, Talmadge, Ohio. Ohio State Univ. 1906. A. V. M. A., 1917.

HORSTMAN, EDWARD, d. Dec. 3, 1922, Fort Worth, Texas. B. June 7, 1868, Cincinnati, Ohio. Cincinnati V. C. 1908. A. V. M. A., 1908.

HOWARD, CHARLES H., d. June 9, 1922, Houghton, Mich. B. June 9, 1868, Amherst Island, Kingston, Ont. McKillip V. C. 1899. A. V. M. A., 1900.

JAKEMAN, WILLIAM, d. June 27, 1923, North Sydney, Nova Scotia. B. 1844, Charlottetown, P. E. I. McGill Univ. A. V. M. A., 1892.

KLOTZ, JOSELH W., d. Dec. 19, 1922, Noblesville, Ind. B. 1868, Arcadia, Ind. Ontario V. C. 1891. A. V. M. A., 1898...

KNOWLES, MORTON E., d. June 16, 1923, Fort William Henry Harrison, Ind. B. 1862, Clinton, Ind. American V. C. 1884. A. V. M. A., 1891. President, 1904-1905.

LA POINTE, R., d. 1923, St. Peter, Minn. McGill Univ. 1885. A. V. M. A., 1902.

LEACH, EDWARD D., d. Feb. 16, 1923, Pittsburgh, Pa. Chicago V. C. 1908. A. V. M. A., 1913.

LEWIS, LOWERY LAMONT, d. Sept. 26, 1922, Stillwater, Okla. B. Sept. 3, 1869, Newport, Tenn. Iowa State College, 1895. A. V. M. A., 1919.

LYON, HENRY C., d. Apr. 30, 1923, Hutchinson, Minn. B. June 4, 1856, Ontario, Canada. Ontario V. C. 1891. A. V. M. A., 1902.

MAYNARD, LEE H. P., d. Oct. 9, 1922, Philadelphia, Pa. Ohio State Univ. 1904. A. V. M. A., 1908.

McBANE, ELLWOOD P., Frankford, Ind. B. Oct. 12, 1890, Graham, N. C. Indiana V. C. 1916. A. V. M. A., 1920.

McCUAIG, DANIEL, d. May 26, 1923, Ottawa, Ont. Ontario V. C. 1892. A. V. M. A., 1903.

McNEAL, HARRY T., d. Nov. 8, 1922, Sunbury, Pa. B. Dec. 13, 1867, Shickshinny, Pa. Ontario V. C. 1895. A. V. M. A., 1916.

MERILLAT, EDWARD, d. July 5, 1923, Wooster, Ohio. B. June 21, 1861, Mt. Eaton, Ohio. McKillip V. C. 1897. A. V. M. A., 1917.

MITCHELL, ADRIAN J., d. July 4, 1923, Erie, Pa. Ontario V. C. 1895. A. V. M. A., 1911.

MOON, WALTER J., d. 1923, Vermilion, Alta., Can. B. 1885. Ontario V. C. 1908. A. V. M. A., 1918.

MONTGOMERY, JOHN, Anamosa, Ia. B. July 12, 1880, Ireland. Chicago V. C. 1912. A. V. M. A., 1918.

MURRAY, ALFRED F., d. 1923, Virginia, Minn. B. Sept. 19, 1890, Teiero, Nova Scotia. Chicago Vet. Coll., 1916. A. V. M. A., 1919.

PAIGE, JAMES B., d. Oct. 5, 1922, Waverly, Mass. B. 1861, Prescott, Mass. McGill Univ. 1888. A. V. M. A., 1891.

PATTERSON, SAMUEL B., d. Feb. 26, 1923, LaCrosse, Wis. B. May 9, 1864, Butler Co., Pa. McKillip V. C. 1910. A. V. M. A., 1919.

RICHARDS, GEORGE L., d. June 1922, Denver, Colo. B. May 27, 1892, Omaha, Nebr. Colorado State Col. 1913. A. V. M. A., 1917.

RICHARDS, W. H., d. Mar. 5, 1922, Emporia, Kans. Ontario V. C. 1887. A. V. M. A., 1890.

RUTHERFORD, JOHN G., d. July 24, 1923, Ottawa, Ont. B. Dec. 25, 1857, Mountain Cross, Mase, Peebleshire, Scotland. Ontario V. C. 1879. A. V. M. A., 1902. President, 1908-1909.

SCHWARZKOPF, OLAF, d. June 3, 1923, Weisbaden, Germany. B. Aug. 19, 1855, Ostromzetzko, Germany. Royal Vet. Col. Berlin, 1880. A. V. M. A., 1890.

SEVENSTER, JOHN, Hamburg, Iowa. McKillip V. C. 1905. A. V. M. A., 1915.

SISLEY, M. J., d. July 27, 1923, Buhl, Idaho. B. Sept. 6, 1891. Michigan Agri. Col. 1915. A. V. M. A., 1921.

STEPHENSON, WILLIAM A., d. Aug. 16, 1923, Salt Lake City, Utah. B. Sept. 13, 1889, Holden, Utah. Colorado Agri. College 1916. A. V. M. A., 1921.

TENNENT, J. H., d. June 29, 1923, London, Ont. Ontario V. C. 1874. A. V. M. A., 1903.

THOMSEN, JOHN, d. 1923, Armstrong, Iowa. B. Nov. 15, 1864. Ontario V. C. 1895. A. V. M. A., 1916.

WEBB, WILLIAM T., d. July 7, 1923, Quarryville, Pa. Univ. of Pa. 1907. A. V. M. A., 1912.

WENDE, HORATIO S., d. July 28, 1923, Tonawanda, N. Y. B. Feb. 4, 1864, Millgrove, N. Y. Ontario V. C. 1886. A. V. M. A., 1913.

WESCOTT, GEORGE F., d. July 7, 1923, Portland, Maine. B. 1869. American V. C. 1897. A. V. M. A., 1904.

WHITTLESEY, R. T., d. May 1, 1923, Los Angeles, Cal. B. 1861. Columbia V. C. 1883. A. V. M. A., 1911.

WRAY, W. H., d. Aug. 24, 1923, Beaconsfield, Bucks, England. B. Jan. 7, 1854, Rathway, N. J. American V. C. 1878. A. V. M. A., 1878.

Our sympathy is extended to Dr. J. F. Barnes, of Toledo, Ohio, on the death of his wife, which occurred on January 28, 1923.

Our sympathy is extended to Dr. John T. Gruber, on the death of his wife, at their home in Marion, Ohio, which occurred on March 24, 1923.

Our sympathy is extended to Dr. C. S. Hayward, Mattoon, Ill., on the death of his mother, who died June 24, 1923.

Our sympathy is extended to Dr. Leonard W. Goss, of Columbus, Ohio, on the death of his brother, Wilbur C. Goss, of Lakewood, Ohio, who died June 30, 1923.

Our sympathy is extended to Dr. Howard J. Milks, of Ithaca, N. Y., on the death of his father, Dr. Wm. J. Milks, of Johnson City, N. Y., who died at his home February 26, 1923.

Our sympathy is extended to Dr. and Mrs. P. W. Horner, of Elkhart, Ind., on the death of their only child, Dorothy Mary, aged seven years, on April 3, 1923.

Our sympathy is extended to Dr. Harry J. Hoffeins, of Alta, Ia., on the death of his wife, March 19, 1923.

Our sympathy is extended to Dr. O. E. Troy, of Raton, N. M., on the death of his wife, November 13, 1922.

Our sympathy is extended to Dr. L. H. Coulson, of Elkhorn, Wisc., on the death of his father-in-law, February 2 and of his father, on February 3, 1923.

Our sympathy is extended to Dr. R. G. Walker ,of Chicago, Ill., on the death of his wife, on March 17, 1923.

Resolution

Inasmuch as it hath pleased Almighty God to take unto himself the above mentioned members of this association, and relatives of some of the living, be it

Resolved that this Association, in convention assembled, do now formally acknowledge the great loss we have sustained in their removal from their earthly labors, and be it further

Resolved that we express our sympathy for the bereavement inflicted upon the immediate families of the dear departed, and be it further

Resolved that a copy of these resolutions be spread upon the records of the Association.

Committee on Necrology
R. R. Dykstra,
J. I. Gibson,
C. D. McGilvray,
J. D. Adams,
A. H. Baker, *Chairman.*

OTHER MEETINGS

NORTH LOUISIANA VETERINARY MEDICAL ASSOCIATION

The North Louisiana Veterinary Medical Association held its second semi-annual meeting at Shreveport, La., May 14, 1924. Dr. H. A. Burton, President, of Arcadia, La., called the meeting to order in the City Hall, at 9:00 a. m. Hon. L. E. Thomas, Mayor of Shreveport, extended a very cordial welcome to the members, and invited us to return at some time in the future. Dr. W. B. Burriss, of Shreveport, responded to the address of welcome.

At this point in the program, out of respect to the memory of Dr. B. G. Bryson, Vice-president of the Association, whose death had occurred very recently, the members, as a body, arose and stood in silence for one minute. Dr. Bryson had been scheduled for a paper on "Equine Influenza." In his place, Dr. N. F. Williams, of Fort Worth, Texas, gave a very interesting talk on the subject of equine influenza and, though he had not come prepared to do so, he was able to give many helpful hints in handling this disease.

Dr. F. W. Franks, of Minden, gave a very instructive paper on "Black Tongue in Dogs," and covered its possible causes, symptoms, diagnosis, and treatment. Dr. Franks was able to make his paper all the more interesting for the reason that he has been unusually successful in the treatment of this condition. Dr. F. J. Douglas, of New Orleans, President of the Dixie Veterinary Medical Association, discussed "The Therapeutics of Arsenic," and reported in detail upon some cases which he had treated with various arsenical preparations. A very thorough discussion of the subject followed.

Dr. G. W. James, of West Monroe, La., was unable to be present, on account of illness, and his paper, entitled "Fright Disease of Dogs," was read by the Secretary. Dr. Rease Mitcham, of Ruston, La., presented a very thoroughly prepared paper on "Bovine Hemorrhagic Septicemia." He discussed the disease from every standpoint. Dr. Paul Quilty, of Lake Charles, La., gave an interesting discussion on "Kennel Management." He discussed this subject as applied to private, commercial, and veterinary hospital kennels, and dealt principally with the subject of sanitation.

Dr. Oscar Dowling, President of the Louisiana State Board of Health, addressed the members on "Dairy Sanitation and Tuberculin Testing from the Standpoint of the State Board of Health." Dr. Dowling explained how the veterinarians throughout the state could cooperate and very materially assist the State Board of Health in its work. He stressed the necessity, upon the part of the practicing veterinarians, of reporting all tests to the proper authorities. Dr. Dowling thanked the veterinarians for their assistance, and acknowledged the importance and value of their services in connection with health matters.

A motion prevailed to merge the North Louisiana Veterinary Medical Association with the Louisiana State Veterinary Medical Association, in order to increase the attendance at meetings in the state, and to create better fellowship in the profession. This completed the business program, following which the meeting adjourned.

Immediately following this adjournment, the Louisiana State Veterinary Medical Association held its regular session. Dr. E. Pegram Flower, State Veterinarian, presided. Dr. Flower called the meeting to order, and the minutes of the previous meeting were read by Dr. A. J. Kendrick, of Homer, La. The first order of business was an election of officers. The following were elected for two years: President, Dr. H. A. Burton, of Arcadia; Vice-president, Dr. Paul Quilty, of Lake Charles; Secretary-Treasurer, Dr. L. H. Bennett, of Monroe.

The next order of business was the selection of a list of eight members of the Association to be sent to Governor Henry L. Fuqua. From this list four members will be selected to act as the State Board of Veterinary Medical Examiners.

The attendance was in the neighborhood of forty, the majority being from Louisiana, with several veterinarians from Texas. On the whole, the meeting was very enjoyable and everyone had a good time.

L. H. Bennett, *Secretary-Treasurer.*

THUMB VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Thumb Veterinary Medical Association was held at North Branch, Michigan, May 15, 1924, with about twenty members and visitors present.

The meeting opened with a clinic held at the hospital of Dr. George D. McIntyre. The latter performed a very difficult

operation on a horse, consisting in the removal of a section of the sternum, which had become necrossed as the result of an injury.

The afternoon session was called to order by Dr. J. E. Wurm, of Pigeon, President of the Association. The minutes of the previous meeting were read and approved.

Dr. H. Preston Hoskins addressed the meeting on "The American Veterinary Medical Association." He called attention to the fact that the veterinarians of Michigan were fortunate in having eight active local associations, holding meetings regularly two or three times a year, these meetings being arranged in such a way as not to conflict. Dr. Hoskins pointed out that these local associations had their own particular functions, just as much as the state and national organizations. He urged every eligible veterinarian to become identified with his local association, his state association, and the American Veterinary Medical Association. Following his address, Dr. Hoskins was elected to honorary membership in the Association.

Dr. Richard Harrison, of Bad Axe, addressed the meeting on "Experience with the Different Tuberculin Tests." In his talk Dr. Harrison brought out numerous valuable points, the result of his very extensive experience in tuberculin testing. He particularly stressed the advantages of the intradermic test.

Dr. J. E. Wurm gave a very interesting case report on "The Protrusion of the Omentum following the Castration of a Four-Year-Old Stallion."

President Wurm made an announcement relative to the coming meeting of the State Association, and stated that one session of the meeting would be made up of contributions from the local associations throughout the state, and that it would be necessary for the Thumb Association to contribute to the program. Drs. George D. McIntyre, of North Branch, and M. J. Geiger, of Croswell, were selected to represent this Association.

An election of officers resulted as follows: President, Dr. J. E. Wurm, of Pigeon, Mich.; Secretary, Dr. Morgan McIllmurray, of Caseville, Mich.; Treasurer, Dr. F. L. Harrison, of Fairgrove, Mich.

M. J. GEIGER, *Secretary.*

We Have Room For A Thousand New Members This Year.

MASSACHUSETTS VETERINARY ASSOCIATION

A meeting of the Massachusetts Veterinary Association was held at the Department of Veterinary Science, Massachusetts Agricultural College, Amherst, Mass., May 21, 1924. A poultry clinic was held during the morning and part of the afternoon of the 22nd.

This session of the Association was devoted largely to the discussion of poultry disease control and was attended by about twenty-five members who were enthusiastic in voting the meeting both profitable and enjoyable. That the poultry industry of Massachusetts offers many possibilities for the practicing veterinarian was clearly brought out and steps were taken by the Association to bring about a systematic development of this field for the practitioner.

Professor Graham gave a very interesting talk, pointing out the economic importance of the poultry industry and showed by comparative figures that more money is invested in poultry than in hogs, sheep or beef cattle. The demand for protecting an industry of such importance must be met by the veterinary profession, although at present few practitioners in the state realize the opportunity of developing this field of practice.

Prof. Gage, Head of the Department of Veterinary Science at the Massachusetts Agricultural College, gave a very interesting outline of what the laboratory has done and is doing in the way of rendering an efficient diagnostic service. He also pointed out this means for the practitioner who is anxious to render a scientific service to his clients. Cooperation between the practitioner and laboratory is essential in order to establish correct diagnoses.

Director Willard, of the Extension Service, spoke on the activities of this service in Massachusetts in connection with the poultry industry. He suggested more activity on the part of practicing veterinarians in the control or treatment of poultry disease. Other speakers were Drs. Thos. Maloney, A. S. Cleaves and L. A. Paquin.

An interesting discussion was entered into by most of those present. For the most part this revolved itself around the question of what plan could be worked out in Massachusetts for developing poultry practice for the practitioner, as well as developing the practitioner for poultry practice.

A committee was appointed to confer with Director Willard and Dr. L. H. Howard, Commissioner of Animal Industry, for

the purpose of working out some definite policy which would develop this branch of disease control in veterinary practice.

A short business meeting concluded the evening session.

The morning session was devoted to a poultry clinic. This included an outline of the osteology, myology and visceral anatomy of fowl; postmortem and vaccination technique, etc., by Dr. Norman Pyle, Research Professor of Avian Pathology at Amherst. Elaborate displays of pathological specimens were exhibited in several of the laboratories. These included gross and microscopical specimens of tuberculosis, bacillary white diarrhea, cocidiosis, fowl cholera, fowl typhoid, etc. Many interesting specimens of various parasites were exhibited and their identification and treatment discussed. In addition a large number of diseased birds were posted.

The Association expressed its appreciation of the high class work being carried on in avian pathology by the Department of Veterinary Science, at M. A. C., and the members felt that they would profit greatly by more frequent visits to this institution.

H. W. JAKEMAN, *Secretary.*

Have You Secured One New Member This Year?

CENTRAL MICHIGAN VETERINARY SOCIETY

The spring meeting of the Central Michigan Veterinary Medical Society was held at the Otsego Hotel, Jackson, Michigan, May 21, 1924, with about forty in attendance. In the absence of Dr. C. C. Mix, President, the Secretary asked Dr. H. P. Hoskins to occupy the chair.

The program was opened with an address by Mr. J. Ed. Whitaker, City Manager of Jackson. His topic was, "The Veterinarian and the Citizen." Mr. Whitaker acknowledged the importance of the veterinarian's place in society, and briefly outlined what the City of Jackson was doing to safeguard the health of her citizens.

The following program was then presented:

"The County Agricultural Agent and the Veterinarian," by Mr. Roy E. Decker, of Jackson.

"Some New Pharmaceutical Preparations and Their Uses," by Dr. O. A. Taylor, of East Lansing.

"Goiter," by Dr. E. K. Sales, of East Lansing.

"Glands that Control Personality," by Dr. Ward Giltner, of East Lansing.

"Municipal Meat and Milk Inspection," by Dr. E. J. McLachlan, of Jackson.

"Hog Cholera," by Dr. W. Madill, of Jackson.

"Contagious Diseases Prevalent in Michigan," by Dr. B. J. Killham, of Lansing.

"Bovine Tuberculosis," by Dr. A. T. Cornell, of Charlotte.

"Some Studies in Cattle Sterility," illustrated, by Dr. E. T. Hallman, of East Lansing.

Following the above program a banquet was served in the dining room of the hotel, followed by a smoker. Dr. B. J. Killham, in the capacity of toastmaster, called upon a number of those present for after-dinner speeches. On the whole, this was one of the most successful meetings ever held by the Association.

W. N. ARMSTRONG, *Secretary.*

Plan To Go To Des Moines, August 19-22.

McLEAN COUNTY VETERINARY MEDICAL ASSOCIATION

A regular meeting of the McLean County (Illinois) Veterinary Medical Association was held June 4, 1924, in the Association of Commerce rooms, Bloomington, Ill. The meeting was well attended in spite of heavy rain and bad roads.

"Ethical Advertising by Practitioners" was presented by Dr. L. N. Morin, of McLean, in his usual able style and evoked spirited discussion. It is the opinion of the veterinarians of Central Illinois that the profession should be letting the public know what it has done, what it is doing and what it can do in the future, for the protection of the live stock industry and the safety of public health.

Dr. M. G. Smith, who recently located at Bellflower, after several years with the B. A. I., described the conditions confronting the profession in South Carolina, where he was stationed for a time.

Dr. L. C. Brown, in charge of area testing work in Piatt County, and Dr. W. B. Van Cleave, in charge of similar work in Peoria County, told of their experiences and the progress of tuberculosis eradication in their respective counties. General discussion followed.

Owing to the Illinois State meeting, July 9-10, and the A. V. M. A. meeting during August, our Association will not hold other

regular meetings until September. However, we will have a big summer picnic at Miller Park, Bloomington, Wednesday, July 30. Everybody will bring their baskets and have lunch together at noon and in the evening. The Bloomers will be playing at home on that date and the ball fans can be assured of seeing a good game. Dancing in the evening. All veterinarians and their families are invited.

J. S. KOEN, *Secretary.*

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS MISSISSIPPI VALLEY DIVISION

The regular monthly meeting was held in East St. Louis, Ill., at the Federal Building, June 7, 1924, at 7:30 p. m. The minutes of the previous meeting were read and accepted. Various letters of correspondence in regard to reclassification, bonus, and retirement were read and acted upon.

Dr. F. E. Hill read a very instructive paper on "Actinomycosis," which was followed by a discussion by Drs. Jenison, Thurmon, Hill and Walch.

It was voted to dispense with the meetings during the summer months, and to hold our next meeting Saturday, October 4, 1924, in St. Louis, Mo.

G. H. BRUNS, *Secretary.*

MAHONING VALLEY VETERINARY CLUB

The quarterly meeting of the Mahoning Valley (Pa.) Veterinary Club was held, June 11, at Indiana, Pa., at Camp Rest-a-While. Practically all of the members were present. The meeting was called to order by Dr. F. A. Marshall, of Indiana, and proved to be the most interesting one the Club has ever had.

Hon. Harry White, President of the Pennsylvania Association of County Fairs, gave a talk on "The Relation of the Veterinary Profession to Agriculture," and extended an invitation to the members of the Club to attend the meetings of the County Fairs Association.

Dr. C. J. Marshall, of the University of Pennsylvania, gave a most comprehensive and complete lecture on "Diseases of the Digestive Organs of the Cow." The lecture was very well enjoyed and discussed.

It was decided to hold the next meeting at Punxsutawney, Pa.

C. M. CHRISTY, *Secretary.*

ARMY VETERINARY SERVICE

ARMY VETERINARY SCHOOL GRADUATION

June 6, 1924, marked a new epoch in medico-military education. On that date the United States Army graduated, at Washington, D. C., the classes of the four schools composing the newly organized Army Medical Center. These schools are the Army Medical School, the Army Veterinary School, the Army Dental School, and the Army School of Nursing.

Amid impressive ceremonies and a large assemblage, Surgeon General Ireland presented 102 graduates to Secretary of War Weeks, to receive their diplomas. The Medical School had 39 graduates, the Veterinary School 7, the Dental School 11, and the School of Nursing 45.

Following a week marked by numerous social events, the graduation exercises were held at 4 p. m., on Friday, June 6, 1924, in the beautiful Formal Garden of the Army Medical Center. Headed by the United States Army Band, the faculties, duty officers, nurses, aides, Red Cross workers, enlisted detachment and graduating classes, under the command of Col. James D. Glennan, commanding officer of the Army Medical Center, marched to the Formal Garden where the graduating classes of the four schools were formally reported by their respective commandants to the Surgeon General.

General Ireland, in introducing the Secretary of War, referred to the progress the Medical Department had made in developing its schools and stressed the advantages in having the four schools closely associated as units of one great Medical Center.

The Secretary of War, in well-chosen remarks, complimented the Medical Department on its attainments and emphasized the responsibilities and importance of the various component parts of the Medical Department to the Army as a whole. He then presented the diplomas to the various candidates.

In the Veterinary School 1st Lieuts. John Harold Kintner and Maximilian Siereveld, Jr., were honor graduates. Lieut. Kintner was also awarded the Hoskins Memorial Medal for having made the highest general average in his class. The other five veterinary officers graduated were: Captain Isaac O. Gladish, Lieuts. Joseph F. Crosby, Frank C. Hershberger, John K. McConeghy and Daniel H. Mallan.

R. A. K.

HOSKINS MEMORIAL MEDAL

The accompanying picture is that of the Hoskins Memorial Medal to be awarded each year to the Veterinary Officer who attains the highest general average in the course of instruction given at the United States Army Veterinary School.

The cost of the die and first medal was defrayed by subscriptions from the Veterinary Officers of the Regular Army, and the medal dedicated to the memory of the late Dr. W. Horace Hoskins

HOSKINS MEMORIAL MEDAL

in appreciation of the services he rendered the veterinary profession in the Army.

It so happened that the first award of the Hoskins Memorial Medal was to 1st Lieut. John Harold Kintner, V. C., who was a student in the last class to which Dr. Hoskins lectured in the School of Veterinary Medicine of the University of Pennsylvania.

R. A. K.

We Have Room For A Thousand New Members This Year.

PITY THE MISSISSIPPI DOGS

It is reported that the Governor of Mississippi recently accidentally signed a law that he really intended to veto. As a result the dogs in his state will be out of luck. The law provides that from March 1 to August 1 of each year all dogs must be muzzled and chained to their kennels; each dog must wear a collar bearing a metal plate showing the name and address of the owner, and effective next year there is a tax of $1 on male dogs and $2 on females.

COMMENCEMENTS

INDIANA VETERINARY COLLEGE

With the closing of the 1923-1924 session of the Indiana Veterinary College, on May 20, the last private veterinary college recognized by the A. V. M. A. ceased to exist. The commencement exercises were held in the College building, and diplomas were granted the following:

G. A. Bryson
E. S. Dennison
John M. Droge
Thomas A. Head
L. O. Leitzman
Ivan G. Martin
C. C. Pink
Thomas M. Powell
Earl Stapp
Benj. H. Steiner

Plan To Go To Des Moines, August 19-22.

KANSAS STATE AGRICULTURAL COLLEGE

The sixty-first annual commencement exercises of the Kansas State Agricultural College were held at Manhattan, May 29, 1924. In the Division of Veterinary Medicine, the degree of Doctor of Veterinary Medicine was conferred upon the following:

George Thomas Bronson
Francis Paul Burke
Charles James Coon
Edward Raymond Frank
Ernest Eugene Hodgson
Gilbert Raymond Killian
Gustave Louis Krieger
George Ely Martin
William Taylor Miller
Raymond Montrose Williams

Prizes won by the veterinary students during the 1923-24 scholastic year had been previously announced at the annual banquet of the K. S. A. C. Veterinary Medical Society, held April 17 (see report in JOURNAL OF THE A. V. M. A., June, 1924).

Dean Dykstra announces that the following students will be candidates for the veterinary degree at the close of the summer session, July 31, 1924:

R. W. Boone
E. F. Hoover
R. Q. Javier
E. C. McCulloch
A. J. Miller

Does Your Wife Know About The Women's Auxiliary?

ALABAMA POLYTECHNIC INSTITUTE

Commencement exercises at the Alabama Polytechnic Institute were held on June 3. In the College of Veterinary Medicine

degrees were conferred upon six members of the graduating class, as follows:

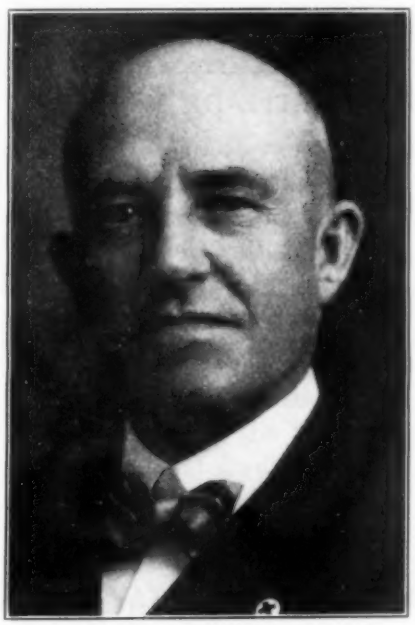
F. A. Clarke
Eddie H. Durr
H. W. Graves
Davis W. Griffin
Grover C. Walding
Arthur H. Williamson

We Have Room For A Thousand New Members This Year.

COLORADO AGRICULTURAL COLLEGE

Commencement exercises at the Colorado Agricultural College were held on the morning of June 5, 1924. In the Division of Veterinary Medicine, the following men received their degrees:

William L. Black
William D. Fountain
Jennings B. Fuller
M. Lloyd Kilpack
Ival A. Merchant
Fred C. Myers
John Myers
George Posse
Boyce Reid
Maurice Shahan
John E. Torrey
Ivan Tucker



DR. GEORGE H. GLOVER

The special feature of this commencement season was the return of graduates of the classes of '84, '94, '04 and '14. The commencement address was delivered by Dr. George H. Glover, of the class of '84. This was considered an especially high

honor for Dr. Glover, for the reason that previously no member of the faculty or alumni body had ever been selected to deliver the commencement address.

Have You Secured One New Member This Year?

IOWA STATE COLLEGE

Commencement exercises at the Iowa State College were held June 9, 1924. There were sixteen graduates from the Division of Veterinary Medicine, as follows:

Frank Bonnstetter
Maurice L. Boevers
George A. Blohm
August F. Burger
Leonard L. Dunn
Hartwell G. Dow
Glen V. Grewell
Chun Jung, Li
Leo P. Miller
Albert R. Miller
Odie B. Neely
Alfred N. Richey
David D. Robertson
John R. Scott
Cletus L. Stanley
Russell W. Meyer

Mr. Maurice L. Boevers was the honor man of the Division.

Plan To Go To Des Moines, August 19-22.

UNIVERSITE DE MONTREAL

The 1924 commencement exercise of the School of Veterinary Medicine of the University of Montreal were held with representatives present from the Federal Government, the Provincial Government, and the College of Veterinary Surgeons of the Province of Quebec. The following received their veterinary degree:

Alf. Cherrier (*summa cum laude*)
J. J. Piche (*cum laude*)
J. E. Marcil (*cum laude*)
F. Collin
W. Robin
E. Richer
A. Leveille

The Montreal City and District Savings Bank prizes, offered for the best showing in economics, were awarded to:
C. Rouleau '25 and A. Marcil '27.

Does Your Wife Know About The Women's Auxiliary?

OHIO STATE UNIVERSITY

Graduation exercises at the Ohio State University were held June 10, 1924. The event marked the completion of twenty-five years of service of Doctor W. O. Thompson, President of the University, and he was tendered a Jubilee Dinner and reception

at the Scioto Country Club, by the trustees, faculty, student body and alumni of the University. The dinner was a magnificent affair at which nearly five hundred attended.

Doctor Thompson was presented with a magnificent hand-worked book, a creation of the Department of Fine Arts, in cooperation with the Department of Engineering Drawing. All present at the banquet signed the book, as did the Governor and several ex-Governors of the State of Ohio. Dr. David S. White, Dean of the College of Veterinary Medicine, represented the University Faculty and responded to a toast at the dinner.

The commencement exercises were held in the Coliseum at the State Fair Grounds. Eighteen graduates received the degree of Doctor of Veterinary Medicine, as follows:

Howard Mack Bonifield
Thomas Benjamin Burris
Raymond Chester Coulson
John M. Hendrickson
Maynard E. Kilpatrick
Roy Virgil Loudon
Arthur Alexander McMurray
Harold Melgaard
Andrew Clarence Merrick
Victor Henry Miller
Leonard Henry Schmidt
Tarjie Steenerson
Arthur Rochus Theobald
Elwood Franklin Tittle
Hugo Baldonado Tugbang
Fred Von Kaenel
Dayton McRae Warren
Orville Grant Wiseman

At the end of the Autumn Quarter three candidates received their veterinary degree:

Frank G. Loomis
Herschel J. Wright
Mariano S. Pasis

This makes a grand total of 21 to be graduated during the year.

We Have Room For A Thousand New Members This Year.

STATE COLLEGE OF WASHINGTON

Commencement exercises at the State College of Washington were held June 12, 1924. Among the 350 seniors who received their diplomas, there were four graduates from the College of Veterinary Science. These men received the degrees of Bachelor of Science and Doctor of Veterinary Medicine:

James A. McGavick
Grant Woodward
Eugene C. Jones
Ernest Houchin

On the same day, these men received their certificates of attendance and scientific endeavors from the Students' Veterinary Medical Association. All of the graduates had been placed before graduation. They remained at Pullman to take their state board examinations, Monday, June 16, and immediately thereafter all left to take the positions that they had already secured.

MISCELLANEOUS

OKLAHOMA VETERINARIANS TO MEET AT MEDICINE PARK

The Summer Congress of the Oklahoma State Veterinary Medical Association will meet at Medicine Park, Okla., July 15-16-17, 1924. This gathering will be somewhat of a new feature. Last year the Oklahoma boys decided to try the experiment of holding their summer session at Medicine Park, a pleasure resort in the Wichita Mountains, and it was so successful and encouraging that it was decided to try it on a larger scale and make it a Veterinary Congress, with a view of interesting veterinarians other than Oklahomans.

There are several very attractive features connected with Medicine Park for such a meeting. This location is quite rural, making it an ideal place to get away from business and the rush and bustle of densely populated cities. The city of Lawton, in recent years, constructed a dam across a mountain gorge of Medicine Creek, sixty feet high, which furnishes a large lake of pure spring water that is abundantly stocked with fine fish. This and many other good fishing waters in these mountains make it an ideal place for those who like to indulge in this sport. Veterinarians who camped for a week, two or three miles below this dam, told me personally that they practically lived on fish while there and so far as quality was concerned, they could not be surpassed.

The government maintains a preserve of wild animals covering many thousands of acres of these mountains, which are well stocked with deer, antelope, buffalo and, in fact, nearly all America's game animals. This reservation is provided with many beautiful drives and one scarcely tires of the pleasant hours spent in this way. Excellent bathing facilities and pure running water are also features greatly enjoyed by all and a large, airy dance pavilion furnishes an excellent place for meetings as well as abundant amusement for those who like to indulge in dancing.

A splendid hotel and numerous cottages, dotted over the mountainside, furnish an abundance of accomodations of almost any kind one desires. The hotel people are most accomodating and very reasonable in their prices. Cottages can be procured

at a very reasonable figure, either for sleeping purposes or completely furnished for light housekeeping. A splendid program has been arranged so as not to be burdensome, leaving plenty of time for recreation, so I do not know where there is a more ideal place to spend a few days in recreation, coupled with a little scientific study, and an opportunity for veterinarians and their families to become acquainted, than Medicine Park. Why not make arrangements to visit this beautiful pleasure resort and enjoy the association of your brother veterinarians and their families? The writer hopes to see you there.

R. C. Moore.

ECLECTIC DIPLOMACY

Doctor Cutter, an eclectic,
Was a surgeon quite as hectic
As was anyone who wields a wicked knife.
His diploma, new and clean,
Hung by wire—to be seen
By the patient who entrusted him his life.
It adorned his office, neat,
Which was on a busy street
In a city in this wicked world of strife.

II

Now, this Doctor Cutter, surgeon,
Had become such without urgin'.
He had studied his profession overnight.
He had coughed up his tuition,
And been made full-fledged physician
By diploma manufacturers of might.
They had sold him his credentials
And his surgical essentials
In a manner quite efficient, though not right.

III

Soon this Cutter, the eclectic—
He could tell an appendectic
Because he had a pain on the right side.
With a stethoscope he'd listen
To a heart-valve that was missin'.
And adjust it so the patient never died.
In short, he felt quite clever,
And as good a man as ever
Pointed at his worldly works with pride.

IV

But, one day to this physician
Calmly came a politician
With a wicked wound upon his hoary head.
"Ah, the skull is fractured, surely,"
Said this Cutter, quite demurely.
"I shall operate and then put you to bed."
And forthwith he operated,
But alas, it must be stated,
That the politician soon was stony dead.

L'envoi

So, beware the quack physician
Or you'll find yourself a wishin'
That you'd never harkened to his artful ad.
The old-time family "Doc."
Is as solid as a rock.
As a healer he's the best we've ever had.

—*Knight Awdlee Hughes.*

Plan To Go To Des Moines, August 19-22.

NEW LIGHT THROWN ON TUBERCULOSIS ERADICATION PROBLEM

Results of experiments concluded this spring at the College of Agriculture refute the old theory that avian tuberculosis—the type found in chickens and birds—is not related to swine tuberculosis and may ultimately modify the present methods being used in ridding swine of the disease, according to Dr. Robert Graham, Chief of the Animal Pathology and Hygiene Division of the College of Agriculture.

Heretofore, animal disease workers have held to the belief that 95 per cent of the tuberculosis in swine was the bovine type and therefore that if the disease was eradicated in cattle herds, swine automatically would be freed of the plague. However, the problem has not worked out this way as shown by the fact that swine tuberculosis has increased at a rapid rate while bovine tuberculosis has decreased and even been completely wiped out in some sections, due to the intensive campaign being waged against it.

In view of the significance of the evidence which the College

has collected, the State Department of Agriculture has appointed seven veterinary inspectors who have just been given special instruction at the College and sent out into the field to follow up the lead of the laboratory investigators and find out if possible just what part, if any, avian tuberculosis is playing in the increasing amount of swine tuberculosis. These inspectors will make a survey of 200 farms in the next few months where it appears that avian tuberculosis may be affecting swine.

The experiments concluded by the College this spring were started in 1921 and show that swine may be infected with avian tuberculosis by four methods. Two of these methods are experimental but the other two might enter into an outbreak of swine tuberculosis on any farm where chickens with the disease are kept. These two methods, which are of particular interest to the farmer, are the eating of tuberculous fowl organs by hogs and the eating of grain mixed with the dropping of tuberculous fowls.

As soon as the College animal pathologists had proved that the avian type of tuberculosis could be communicated to swine, they immediately became suspicious that the increased amount of tuberculosis in hogs might be related to the avian type of the disease. An investigation of this phase of the problem is now in progress. Through the cooperation of Homer R. Davison, Live Stock Commissioner at the Chicago Live Stock Exchange, selected glands of hogs slaughtered on the Chicago market are sent here to be examined for the type of tuberculosis. Although this phase of the investigation has just been started it already has brought out the fact that hogs on certain Illinois farms are infected with the avian type of the disease.

The veterinary inspectors appointed by the State Department of Agriculture to continue this phase of the investigation in the field are Drs. D. S. Jaffray, Chicago; A. E. Dickerman, Springfield; A. C. Tillman, Earlville; C. F. Behner, Marshall; R. W. Merriman, Auburn; W. C. Ekley, Galesburg, and D. A. Cahill, Champaign. They were given three days of special instruction by the College animal pathologists in order that they might become familiar with the details of swine and avian tuberculosis and make a study of the problem on various farms. (University of Illinois Extension Messenger, VII, 21.)

Have You Secured One New Member This Year?

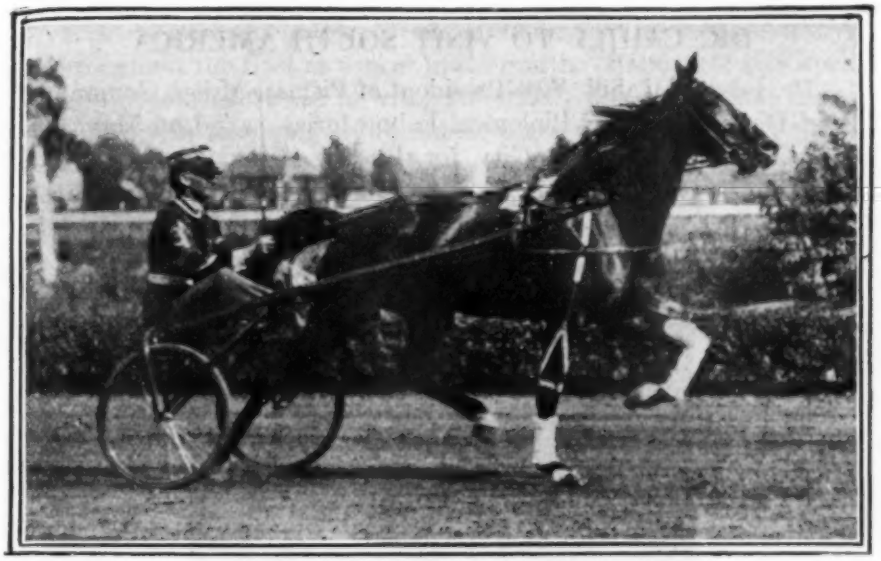
WORLD'S FASTEST PACERS TO RACE AT DES MOINES

The three greatest pacers in the world today, each horse a great drawing card in itself wherever it is entered, will be brought together at the Iowa State Fair on Saturday, August 23.

SIR ROCH—1:59¾

Single G, 1.58½, champion pacing stallion, Margaret Dillon, 1.58¼, champion pacing mare, and Sir Roch, 1.59¾, champion pacing gelding, are the three horses that will appear in this great match race at the State Fair.

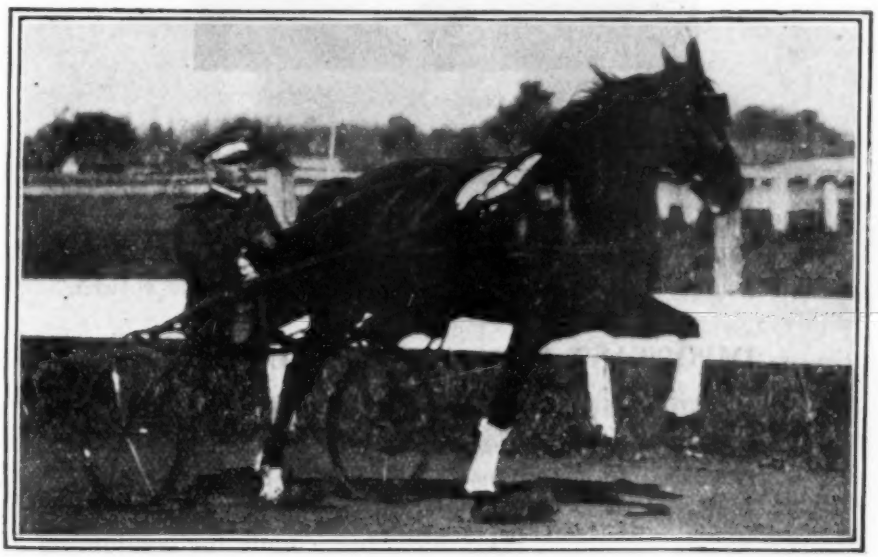
The race will be for a $5,000 added money purse, which has been announced by the Fair Board and which was necessary to bring all three this far west Officials predict that it will be the greatest harness event ever seen in the history of the western



MARGARET DILLON—1:58¼

tracks and it is expected that the crowd coming to the Fair, on August 23, will number thousands of track fans from surrounding states who will come to see this remarkable classic.

Do not forget that this great racing event is scheduled for the day following the close of the A. V. M. A. 1924 convention, at Des Moines. The Local Committee on Arrangements is working with the Iowa State Fair officials to put on special attractions for the veterinarians. This big race is one of them.



SINGLE G—1:58½

DR. CAHILL TO VISIT SOUTH AMERICA

Dr. Edward Cahill, Vice-President of Pitman-Moore Company and Director of their Biological Laboratories, sailed on May 31, 1924, from New York City for Buenos Aires, on the S. S. Vandyck. He will travel for several months, investigating live stock diseases and conditions in Argentina, Uruguay, and

DR. EDW. A. CAHILL

Brazil, in the interests of his company. Dr. Cahill's many friends, from all over the United States, will miss his presence at the Des Moines convention of the A. V. M. A., as he has been a familiar figure at these gatherings each year during the last decade. We wish him a pleasant trip and a safe return.

IMPORTANT PURCHASE CONSUMMATED

The attention of our readers is directed to page 21 of our advertising section, where announcement is made of the purchase, by the Cassius Way Company, 30 East 42nd Street, New York, N. Y., of the business of manufacturing the glandular extracts known as "synergins." Plans have been made for conducting

extensive experimental work, along the lines of hormone therapy, throughout the East as well as in the South. Reports of this work will be looked forward to with interest, for the reason that endocrinology is assuming a prominent place in medicine and there is no reason why the same thing should not be the case in veterinary medicine, to a more limited degree, however.

Does Your Wife Know About The Women's Auxiliary?

DR. ROBERT GRAHAM GOES TO HAITI

Dr. Robert Graham, Chief of the Division of Animal Pathology and Hygiene of the College of Agriculture, University of Illinois, has been granted a leave of absence for one year so that he may go to Port-au-Prince, Haiti, and there take charge of, and

DR. ROBERT GRAHAM

organize, animal disease control work for the Republic of Haiti. Dr. Graham will also supervise the construction and equipment of a laboratory building. Dr. and Mrs. Graham sailed from New York June 5th. Dr. I. B. Boughton, assistant to Dr. Graham, will be Acting Chief of the Division during the latter's absence.

Dr. Graham's experience, first with the University of Kentucky, where he organized a veterinary department and supervised the construction and equipment of an up-to-date, hog cholera serum laboratory, then in the Laboratory Section of the U. S. Army, during the War, and later, at the University of Illinois, where he has been Chief of the Animal Pathology and Hygiene Division for the past six years, peculiarly fits him for the mission which has taken him to Haiti.

We Have Room For A Thousand New Members This Year.

NEW VACCINATING OUTFIT

Drs. E. A. and J. R. Shikles, of Dearborn, Mo., have invented an apparatus for use in connection with the administration of anti-hog cholera serum that is a distinct innovation, and it is believed that it will revolutionize methods of serum administration.

Twelve years ago, when veterinarians were just beginning to use anti-hog cholera serum in any amount, there was not available a first-class, hypodermic syringe with a capacity over a few cubic centimeters. Since that time, there has been constant progress made in the improvement of syringes for veterinary use. The old leather-plunger syringe is now practically a thing of the past. With it has gone the cumbersome, all-metal syringe, which did not allow the user to see what he was doing. Plungers, barrels, grips, and needles have been constantly improved.

The vaccinating outfit devised by the Shikles Brothers is still another step forward. With it the veterinarian can withdraw the serum from the bottle into the syringe without exposing the serum to the air. A specially designed valve, attached to the outlet of the syringe, enables the operator to fill the syringe and discharge the contents easily and rapidly and without leaking. There is practically nothing to get out of order. The syringe is easily cleaned with a disinfectant solution, and the whole outfit may be sterilized by boiling, if desired. It requires no lubrication. A seamless rubber bag, holding two thousand cubic centimeters, may be used in connection with the syringe, where a large number of hogs are to be vaccinated. Serum may be transferred from the original containers to the rubber bag, which is equipped with a specially molded top, without risk of contamination.

It is believed that the cleaner and better work that will be possible with a device of this kind will impress hog owners favorably. With the present methods employed in serum production, veterinarians are reasonably assured of serum free from contaminations, and when the serum is handled properly after getting into their hands, with due regard to the proper cleansing of the site of injection, there is no reason why abscesses should develop, even when surrounding conditions are not all that might be desired.

Have You Secured One New Member This Year?

A WORD OF APPRECIATION

Of the various countries with which we had war, America was the first to re-establish friendly relations with this journal. In this connection I ought to mention some of our American colleagues who have been particularly helpful in providing us with American literature many times; especially should be mentioned Dr. Adolph Eichhorn, Dr. H. Preston Hoskins and Dr. D. H. Udall. Our especial thanks are due to these gentlemen. England, Belgium and France boycotted us completely, and the journals from these countries have to be obtained through mediation of neutral states. (*Tierarztliche Rundschau*, April 6, 1924).

Does Your Wife Know About The Women's Auxiliary?

STATE BOARD APPOINTMENTS

Dr. E. F. Kubin (K.S.A.C. '09), of McPherson, Kan., has been elected secretary of the Kansas State Veterinary Examining Board.

Dr. R. F. Coffey, of Eskbridge, Kan., has been appointed a member of the Kansas State Veterinary Examining Board, succeeding Dr. B. W. Conrad.

Dr. H. L. Feistler, of Auburn, Nebr., has been appointed a member of the Nebraska State Board of Veterinary Medical Examiners, succeeding Dr. George A. Young.

Dr. Otto Faust (Amer. V. C. '88), of Poughkeepsie, N. Y., was recently reappointed a member of the New York State Board of Veterinary Medical Examiners, for a term of five years.

Dr. E. Calldemeier (Chi. '11), of Louisville, Ky., has been appointed a member of the Kentucky State Board of Veterinary Medical Examiners, succeeding Dr. C. A. Miller (Chi. '90), his partner, whose term of office expired July 1, 1924.

We Have Room For A Thousand New Members This Year.

COMMUNICATIONS

THE SITUATION IN CALIFORNIA

To the Editor:

Regarding your report on an article taken from the *Los Angeles Times*, also the statement of our governor that we needed more veterinarians and less hysteria, implying a shortage of veterinarians, let me say that for the first two or three weeks this might have been true.

First, you must take into consideration that California is some state in area, at least averaging about 200 miles wide by about 1000 miles long, the topography of which includes about everything in nature, with ranches varying in size of from one-half acre to high in the thousands. Couple this with the fact that this scourge made jumps of from 150 to 500 miles, creating foci of infection at widely separated points, involving territory composed of thickly settled valleys and wild mountainous regions. It is little wonder that our local Department of Agriculture was handicapped, being on a "peace footing," so to speak.

However, with a little publicity and beating of the brush, veterinarians from everywhere—real estate offices, ranches, stores, plumbing and carpenter trades, hot dog stands and chicken ranches—came to the rescue. All these men were graduates, and all with more or less years of practice behind them in other states, and many with previous experience with this disease, so that after the first month a surplus of veterinarians has been the rule, and the Department has been turning down competent men daily. As one old timer out here remarked to me, "I never knew there were so many veterinarians in this State."

The loss in the state to date has been 93,109 animals, including cattle, hogs, sheep and goats. Indemnity value, $3,697,406. Property destroyed, $45,000. Los Angeles County has 30,000 head of dairy cows alone. The loss in this county, in all animals destroyed, is 18,150, with indemnity value of $1,350,943. The condition around the San Francisco Bay district is very good. In Merced County, to which it jumped from the bay district, a distance of 150 miles, it is still a menace, due to the fact that the infection is largely confined to large mountain ranges,

making its control extremely difficult, but it is rapidly improving.

Los Angeles County, in which it next appeared, making a jump of 500 miles, is in a much better condition than it was three weeks ago, the infection being now confined to a very thickly settled (cows) district and while the loss there is sure to be great, there seems little inclination for it to spread from this point at present, and we hope to confine it to that point. The sporadic outbreaks in the San Jocain Valley have subsided and little anxiety is felt for this district. All in all the conditions seem favorable and, with the force at work and the spirit of cooperation exhibited on all sides by those conducting the fight, coupled with the fact that California "will not down," you may say that, while we may be knocked down, we are by no means "knocked out."

J. L. TYLER.

Huntington Park, Calif., June 6, 1924.

PROBABLY PERITONITIS

TO THE EDITOR:

I wish to comment on the article, "Laminitis or What?" by Dr. F. W. Crawford, of Big Fork, Arkansas, in the June issue of the JOURNAL OF THE A. V. M. A.

The train of symptoms, as mentioned, included: head hanging very low; feet bunched under, but with hind feet rather far apart; great pain and depression, but actions not violent; lost flesh greatly and weak; rather stiff and disinclined to move; very watery and violent stools; respirations grunting; otherwise normal; temperature, 102°F.; pulse, imperceptible; heart, slow and weak; desired water continuously. In the paragraph mentioning the treatment, the author states, "She would occasionally lie down, only to rise painfully again."

After studying these symptoms, I cannot help but think that the writer was dealing with an acute peritonitis as a sequela of the gastritis. The picture as described by the symptoms is quite diagnostic of peritonitis, excepting the temperature (as indicated by the thermometer). One cannot always depend on the thermometer, and in this particular case I am inclined to think there was more fever, because of the abnormal craving for water.

R. S. BEAVER.

Shelby, Iowa, June 10, 1924.

AN ANNOUNCEMENT

To the Editor:

I desire to announce to my colleagues that I have had no connection whatsoever with the publication known as *Veterinary Medicine,* formerly the *American Journal of Veterinary Medicine,* published at 4753 Grand Boulevard, Chicago, since January 1, 1924, and that the continued use of my name on the reading pages is done without my consent, against my expressed wishes, and in violation of an expressed agreement and understanding between the writer and the managing editor of that journal, entered into at the time the writer severed his connection with that publication. The continued use of the name of E. Merillat on the stationery of *Veterinary Medicine* is also unauthorized and against the request of his widow.

L. A. Merillat.

Chicago, Ill., June 10, 1924.

We Have Room For A Thousand New Members This Year.

NEWS NOTES

The City of Stanford, Kentucky, recently passed an ordinance making it unlawful for anyone to sell milk or butter in the city unless the cows furnishing these products had been tested for tuberculosis within a year.

The town of Geneva, Indiana, recently passed an ordinance requiring the tuberculin test every twelve months for all cows in dairies supplying milk to the town. Further provision is made for testing all additions to the herd within seven days after purchase. Tests are to be conducted by state, federal or accredited veterinarians. Cows and stables must be kept in a clean and sanitary condition.

Fifty counties in Illinois are now engaged in the work of tuberculosis eradication, Winnebago County being the most recent to take up the work. It is reported that several other counties are seriously considering the advisability of engaging in the work.

Two horses owned by a tobacco farmer, near New Haven, Conn., while not superlatively valuable animals, were listed in his bankruptcy petition at twice the worth of his two automobiles. He values the horses at $200 and the automobiles at $85.

NECROLOGY

GEORGE D. YOUNG

Dr. George D. Young died May 23, 1924, at Phoenix, Arizona, where he had been located for about a year and a half, in search of health.

Born in Fremont, Ohio, January 8, 1868, Dr. Young grew to manhood in Gambier, Ohio. He was a graduate of Kenyon College and of the Kansas City Veterinary College, class of 1906. Dr. Young soon entered the meat inspection service of the Bureau of Animal Industry and was stationed at Kansas City, Washington, and later as inspector-in-charge at the Hammond Packing Company plant, Chicago. Ill health caused him to retire from active service about eighteen months ago.

Dr. Young joined the A. V. M. A. in 1907. He was a member of Southgate Lodge No. 968, A. F. & A. M., of Chicago. He was a member of Phi Beta Kappa Fraternity. He is survived by his widow and two brothers. Dr. Young was noted for his love of nature and his kindness to animals. His many friends will grieve to know of his passing.

OWEN MOORE

Dr. Owen Moore, of Clayton, Ill., died suddenly, May 26, 1924. Death came while on a professional call and culminated a heart affliction from which Dr. Moore had been suffering for several years.

Born at Clayton, Ill., October 19, 1871, Dr. Moore had spent his whole life in that community. He attended high school and was graduated from the Kansas City Veterinary College in 1910.

Dr. Moore joined the A. V. M. A. in 1920. He was a member of the Illinois State Veterinary Medical Association and of the Missouri Valley Veterinary Association. He was a member of the Elks. He was at one time Assistant State Veterinarian of Illinois.

Dr. Moore is survived by his widow, one daughter and a brother.

Dr. W. W. Nickerson, of Emington, Ill., died May 2, 1924, at the age of 75 years. He had been located in Emington 37 years. Cancer of the stomach was the cause of death.

LEONARD L. CONKEY

Dr. Leonard L. Conkey died at his home in Marne, Mich., June 6, 1924. He was born in Arlington, Mich., May 8, 1857.

Dr. Conkey founded the Grand Rapids Veterinary College, in 1897, became president of the institution and later was graduated from it, not previously having had a veterinary degree. He had attended the Veterinary Department of the Detroit College of Medicine for one term, but left this institution, with Dr. Hugh Rutherford, about 1897, to start a veterinary college in Grand Rapids. This was run as a two-year institution until 1903, when the course was lengthened to three years. Graduates of the two-year course were first recognized by the A. V. M. A. in 1911.

Regarded as a genius in some respects, Dr. Conkey was a very skilful surgeon, his ability in this field being built upon his deep knowledge of anatomy. He traveled all over the United States to operate upon valuable race horses. On one occasion, while in England, it is reported, he performed an operation on a hunter owned by King George. Dr. Conkey invented the hobbles which bear his name, and the equine operating table, now known as the "Simplicity," is the outcome of his inventive skill.

Dr. Conkey was always a turbulent figure in veterinary affairs in Michigan. Some will remember his attending one of the meetings of the A. V. M. A., about twenty years ago. Dr. Conkey was not a member, nor was he eligible to membership at that time. After his return home, he had his photograph taken in Prince Albert coat and high silk hat. Then he had the photographic plate retouched in such a way as to show him standing in a heavy snow-storm, indicative of his cool reception at the convention. He sent copies to a number of the prominent members of the Association. It was quite characteristic of him.

He leaves a widow and one son.

KILBURN H. CLEAVER

Dr. Kilburn H. Cleaver, of Reading, Pa., died at his home, April 8, 1924. He was a graduate of the Ontario Veterinary College, class of 1879.

A. N. STEWART

Dr. A. N. Stewart, of Rockford, Iowa, died April 9, 1924, at the age of 71 years. He was a graduate of the Ontario Veterinary College, class of 1902.

Dr. William A. Lewis, of Piqua, Ohio, committed suicide by shooting himself in a barn near Millersburg, Ohio, May 23, 1924. He was 64 years of age.

Dr. Wilbert Lew, of Amherst, Mass., a registered non-graduate practitioner, died recently.

Dr. George Bedinger, formerly of Bloomington, Ill., died in California, May 4, 1924.

Have You Secured One New Member This Year?

MARRIAGE

Dr. H. A. Cantwell, of Shawano, Wis., to Miss Bess Burns, of Marshfield, Wis., at the latter place, April 19, 1924.

BIRTHS

To Dr. and Mrs. J. L. Boyle, of Lindsay, Nebr., a son, Carroll James, March 27, 1924.

To Dr. and Mrs. E. B. Cavell, of Northville, Mich., a daughter, Marilyn Ann, May 19, 1924.

To Dr. and Mrs. I. J. Kleveland, of Sioux Rapids, Iowa, a son, Ingram Junior, April 11, 1924.

To Dr. and Mrs. G. E. Melody, of Rockwell City, Iowa, twins, a daughter, Katherine Jane, and a son, Thomas Dan, May 14, 1924.

To Dr. and Mrs. F. E. Williams, of Duncombe, Iowa, a son, Fred Elven, Jr., April 29, 1924.

To Dr. and Mrs. H. J. True, of Bancroft, Neb., a son, G. Lew, May 4, 1924.

To Dr. and Mrs. A. J. Kohl, of Holstein, Iowa, a son, Russell William, May 7, 1924.

To Dr. and Mrs. Rembrandt Morgan, of Winfield, W. Va., a son, Rembrandt Junior, May 11, 1924.

Plan To Go To Des Moines, August 19-22.

PERSONALS

Dr. Chas. B. Cain (Corn. '23) has located at Little Springs, Miss.

Dr. G. B. Bradshaw (Ala. '19) is now located at Pelahatchee, Miss.

Dr. J. J. Jones (Gr. Rap. '13) has removed from Cardiff to La Plata, Md.

Dr. L. A. Forge (Chi. '03) was recently elected Mayor of Burlington, Wis.

Dr. E. L. Sidwell (K.C.V.C. '15), has removed from Jerseyville to Hardin, Ill.

Dr. E. C. Hughes (Ind. '16) is now on tuberculosis eradication work in Illinois.

Dr. John Ehlenfeldt (Chi. '18) has removed from Marshall, Wis., to Waterloo, Wis.

Dr. C. L. Phillips (Ohio '19), formerly of Washington, D. C., is now at Ossining, N. Y.

Dr. Glenn V. Grewell (Iowa '24) has asked us to send his JOURNAL to Ferguson, Iowa.

Dr. John K. Bosshart (Corn. '12), of Camden, N. Y., has been in ill health for several months.

Dr. J. C. Anderson (Ont. '24) is assisting Dr. D. I. Remington (K.C.V.C. '13), of Tracy, Minn.

Dr. L. E. Foster (Chi. '12) recently completed four years of service as Mayor of Greenfield, Iowa.

Dr. C. F. Schlotthauer (St. Jos. '23) has accepted a position at the Mayo Laboratory Farm, Rochester, Minn.

Dr. J. B. Kingery (Ind. '06), of Logansport, Ind., has entered into a partnership with Dr. V. H. Cooper, of Kempton, Ind.

Dr. T. F. Krey (N. Y.-Amer. '05) has accepted a position in the Veterinary Department of the Bayer Company, New York City.

Dr. C. C. Walch (K.C.V.C. '07) has been transferred from Leavenworth, Kan., to National Stock Yards, Ill, on meat inspection.

Dr. F. G. Kneup (Cin. '17) has been transferred from Chicago, Ill., to Cincinnati, Ohio, on meat inspection work for the B. A. I.

Dr. S. Brenton (Ont. '80) was official veterinarian at the Detroit Riding and Hunt Club annual horse show, held June 13-14, 1924.

Dr. V. G. Kimball (Corn. '08) addressed the March meeting of the Schuylkill Valley (Pa.) Veterinary Association on "Diseases of Poultry."

Dr. F. D. Owen (N. Y.-Amer. '03), formerly located at Raleigh, N. C., is now in Los Angeles, Cal. His address is 931 Baker St. Maywood Sta.

Dr. William K. Howard (Chi. '07), formerly stationed at Houston, Texas, is now at Pittsburg, Kansas, c/o Hull and Dillon Packing Company.

Dr. L. H. Reynolds (Chi. '15), of Port Byron, Ill., recently lost, by fire, a barn, three automobiles and a buggy. The barn and one auto were insured.

Dr. J. F. Park (Ala. '12), in charge of virus-serum control, at Topeka, Kans., has been transferred to West Plains, Mo., in charge of similar work.

Dean V. A. Moore accompanied the senior veterinary students to Buffalo, April 28, on their annual inspection tour of the packing houses and stock yards.

Dr. Henry Singleton (K.C.V.C. '06), for some time stationed at Pittsburg, Kansas, is now back at Houston Texas, his former home. Address: 102 Delmar Avenue.

Dr. C. B. Clement (K.C.V.C. '05), formerly of Oklahoma City, Okla., is now stationed at Topeka, Kansas, c/o Johnson Serum Co., Crane and Jefferson Streets.

Dr. A. F. Nelson (Chi. '02). formerly of Lebanon, Ind., is now located at Thorntown, Ind. Dr. Nelson is president of the Boone Serum Company, of Thorntown.

Dr. J. W. Connaway (Chi. '90), of Columbia, Mo., recently underwent an operation for gall-bladder trouble and, at last reports, was making a satisfactory recovery.

Dr. S. W. Schuppan (Amer. V. C. '90) has returned to Jersey City, N. J., from Jekyl Island, Brunswick, Ga., where he spent the winter. His health is much improved.

Dr. Vernon P. Norton (Gr. Rap. '05), of Wisconsin Rapids, Wis., has accepted a position with the Poland-China Journal, as field man for the State of Wisconsin.

Dr. B. J. Killham (McK. '12), State Veterinarian of Michigan, motored to Albany, with his family, to attend the Eastern States Tuberculosis Eradication Conference, in June.

Dr. B. H. Yenner (K.C.V.C. '05) has been transferred from Sioux City, Iowa, to Indianapolis, Ind., on virus-serum control for the B. A. I. Address: 1106 Hume-Mansur Bldg.

Dr. Fred M. Maxfield (K.C.V.C. '14) retired from active practice, at Tama, Iowa, June, and has entered state work, as inspector in bovine tuberculosis eradication work in Iowa.

Dr. W. G. Hollingworth (Amer.), of Utica, N. Y., spoke at the New York State Veterinary College, Cornell University, on May 15, his subject being, "Municipal Meat Inspection."

Dr. J. J. Black (K. S. A. C. '23), formerly at the Kansas State Agricultural College, Manhattan, is now at the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

Dr. W. J. Lentz (U. P. '04) was on the program of a recent meeting of the Western Pennsylvania Club for an address on the subject of "Feeding Small Animals in Health and Sickness."

Drs. O. A. Taylor (Mich. '15) and E. K. Sales (Mich. '16) acted as official veterinarians at the second annual R. O. T. C. Horse Show, held at East Lansing, Mich., May 30-31, 1924.

Dr. F. E. McClelland (Corn. '09), of Buffalo, N. Y., was the forum speaker at the N. Y. State Veterinary College, Cornell University, May 8. His topic was, "Practical Hints from a Practitioner."

Dr. James T. Dolan (U. P.'12), for a number of years in virus-serum control work for the B. A. I., has resigned to accept a position with the Lederle Antitoxin Laboratories, at Pearl River, N. Y.

Dr. C. D. Bailey (T. H. '13) has removed from Ralston, Nebr., to Washington, Iowa, where he is in charge of a distributing station for the Liberty Laboratories. Address: 320 West Second Street.

Dr. Louis A. Klein (U. P.'97) addressed one of the recent meetings of the Northeastern Pennsylvania Veterinary Club, on the subject of "Differences in the Action of Drugs on the Digestive Tract of Bovines."

Dr. L. R. Pless (Mich. '20), who has been stationed, for several years, at the Michigan Central Stock Yards, Detroit, for the State Department of Agriculture, has been transferred to Ironwood, Mich., on field work.

Dr. Austin Peters (Amer.), of Harvard, Mass., will spend the next two or three years abroad. He has been a member of the A.V.M.A. since 1883, and recently tendered a check in payment of his dues for two years in advance.

Drs. M. J. Dunleavy (Chi. '07), of Denver, and A. J. Savage (K.C.V.C. '09), of Colorado Springs, have been selected as the official veterinarians for the 1924 Colorado Endurance Ride, to be held August 3-10, 1924, at Colorado Springs.

Dr. Earl P. Maxwell (O. S. U. '15) has resigned his position as field veterinarian with the Ohio State Bureau of Animal Industry, and is now associated with the Columbus Serum Company, as vice-president and assistant manager.

Dr. Roy Schoonover (Cin. '10), of Findlay, Ohio, left for California early in June. He is traveling by auto, and plans to return by way of Des Moines, to take in the convention.

The son of Dr. Wm. H. Kelly (N.Y.C.V.S. '89), of Albany, N. Y., William Henry Kelly, Jr., was a member of the 1924 graduating class of Wesleyan University, at Middletown, Conn. In the Class Day Program, he was assigned "class presents and will."

Dr. S. J. Walkley (McK. '07) now signs "realtor" after his name. He maintains his interest in the A. V. M. A., however, as he recently wrote the Secretary that he was planning to be at Des Moines, and enclosed a check for his dues for the coming year.

Dr. E. W. Porter (O. S. U. '10), who has been connected with the Ohio State Serum Institute for the past fourteen years as Assistant Pathologist, resigned this position June 30, and will engage in private practice at Reynoldsburg, Ohio, after spending several months at the Ohio State University Veterinary Hospital, at Columbus.

Dr. W. A. Hagan (K.S.A.C. '16), of Cornell University, read a paper entitled, "Some Studies on Certain Animal Diseases," before the Central New York Branch of the Society of American Bacteriologists, at Geneva, N. Y., on May 10. Dr. H. L. Gilman (Corn. '17) presented a paper, "A Review of Our Present Knowledge of Abortion in Cattle," at the same meeting.

Dr. Theo. A. Burnett (Amer. '89), former state veterinarian of Ohio and former secretary of the U. S. Live Stock Sanitary Association, was in Lexington, Ky., recently. He is interested in an automobile accessory manufacturing concern, at Springfield, Ohio. Dr. Burnett formerly represented Pitman-Moore Co. in the Southeastern states, but severed his connections with that firm in November of last year.